STAVATTI™

MACHETE RDT&E

A BUSINESS OVERVIEW & SUMMARY OF THE SM-27S/T MACHETE™ RDT&E PROGRAM AS UNDERTAKEN BY THE MILITARY AEROSPACE/TACTICAL AIR WARFARE SYSTEMS DIVISION OF STAVATTI

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This RDT&E PAPER Corresponds to the SM-27 MACHETE COIN, Fixed Wing Aircraft

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I. INTRODUCTION

The STAVATTI **SM-27 MACHETE™** is America's only all new, dedicated COIN/Light Attack Aircraft. Designed from the ground-up as a direct successor to OV-10 BRONCO and A-37 DRAGONFLY attack/FAC aircraft, the SM-27 MACHETE is ***THE*** next generation **SUPER-COIN**.

There is a distinct need for a capable replacement for OV-10s and A-37s operated by U.S. allies world-wide. With over 230 such aircraft still in service today, STAVATTI identifies the SM-27 MACHETE as the only new platform which will effectively address this type requirement. Furthermore, the USAF/AFRES/ USANG has been operating 116 OA-10As to satisfy the FAC role. The average age of these platforms has exceeded 22 years and this type will require replacement within the next 10 to 20 years. The SM-27 is an appropriate successor to this type in the FAC role.

The Tactical Air Warfare Systems Division of the Military Aerospace Sector Enterprise of STAVATTI is now developing the SM-27 MACHETE aircraft to satisfy a variety of military missions including COunter INsurgency (COIN), Close Air Support (CAS), Light Attack (LA), Forward Air Control (FAC) and Advanced Trainer (AT). Although MACHETE conceptual development was initiated in 1995, advanced design of the COIN platform was not authorized by the STAVATTI Board of Directors until August 2000, when a clear customer need became apparent to STAVATTI management. That clear customer need was a requirement by an Asia/Pacific Rim nation for a COIN platform to aid in the dispatchment of fundamentalist rebel insurgents.

The SM-27S MACHETE is a single seat, single engine light attack and COIN platform. Featuring a three-surface arrangement consisting of a high aspect ratio wing, low aspect ratio canard foreplanes and an all-moving horizontal tail, the MACHETE is being developed for conventional ordinance delivery at low altitudes and low speeds. Designed to replace proven COIN types including the CESSNA A-37 DRAGONFLY, ROCKWELL OV-10 BRONCO, as well as perform as a successor to the highly effective DOUGLAS A-1 SKYRAIDER of the Korean and Vietnam Wars, the MACHETE is a high value, high performance light attack aircraft for limited brushwars and total wars alike.

The SM-27T is a two place tandem variant of the MACHETE. The SM-27T is not only suitable for CAS, COIN, LA) and FAC missions, but service as both a Primary and Advanced Trainer. Competing directly with the PILATUS PC-9/PC-21, RAYTHEON T-6A/AT-6B TEXAN II, EMBRAER EMB-312/314/AT-29 SUPER TUCANO and KAI KO-1/KT-1, the SM-27T will present fast jet handling in a next generation configuration suitable for instruction through Lead-In Fighter.

Requiring a 36 month Research, Development, Testing and Evaluation (RDT&E) effort, the MACHETE program will consist of twelve months of engineering design, six months of prototype assembly and eighteen months of flight testing, FAR 25 certification and weapon system qualification under MIL-C5011A. Upon receiving type and production certification, the MACHETE will enter production at a STAVATTI owned and operated facility. Total employment associated with the MACHETE program is projected at over 300 engineers, administrators and aerospace machinists and assembly workers at full production. MACHETE Peace-Time Full Rate Production is projected to begin in 2009 resulting in the delivery of up to 50 aircraft annually consisting of an estimated 33 SM-27S and 17 SM-27Ts.

Total MACHETE development program costs are estimated at [redacted] million. Marketed to the air defense arms of US and NATO allies, estimated average per unit flyaway cost of the SM-27 MACHETE (including both the SM-27S and SM-27T) is approximately $8.4 million. The anticipated market for the MACHETE consists of no less than over [redacted] nations purchasing approximately [redacted] aircraft valued at over [redacted] billion. With annual program revenues of over $400 million and net earnings of nearly $150 million, STAVATTI estimates a [redacted] fold Return On Investment [redacted] ROI) over program life.

II. BACKGROUND & SIGNIFICANCE OF THE PROGRAM

STAVATTI initiated MACHETE development in August 2000 in direct response to the insurgent threat poised by Mojahedin factions in Asia/the Pacific Rim. At that time, the Philippines was embroiled in violence perpetrated by fundamentalist terror groups, with PhilAF OV-10s being a quasi-effective instrument in fighting back. Recognizing that the OV-10 and A-37 were still being used to counter shoulder launched missile equipped insurgent forces in the Pacific Rim and worldwide, it became evident that a next generation SUPER-COIN is absolutely necessary to replace these dated airframes. Both the OV-10 and A-37 were introduced in 1967 and will be nearly 40 years old by the time the MACHETE will enter projected Full Operational Capability (FOC) in 2005-2007. With conceptual design completed in August 2000, MACHETE Advanced Design began in October 2000. STAVATTI conducted the MACHETE program as a contractor initiated, privately funded venture oriented toward the mass production of aircraft for Direct Commercial Sales (DCS) to qualified customers. As no U.S. DoD agency has issued a COIN/FAC aircraft requirement since the 1964 USMC LARA requirement[1], STAVATTI began the MACHETE program to satisfy *anticipated* future military aircraft needs and requirements.

By 2001, STAVATTI had begun the Integration and Detail Design phase, with principal Industry Team Members, including Pratt & Whitney Canada, Elta, Elisra and Martin Baker, selected. In September 2001, it became apparent that fundamentalist terror groups were not isolated to the Philippines and Middle East. The 9/11 World Trade Center and Pentagon attacks confirmed STAVATTI's general perception that fundamentalist terrorist groups were a bona-fide, capable threat which required decisive, dedicated dispatchment. Shortly thereafter, Al-Qa'ida entered the American vernacular and the "anticipated future military needs" which drove MACHETE program creation became a clear reality. Since 2001, the United States and Coalition Forces have been engaged in wars of COunter-INsurgency in Afghanistan, Iraq and terrorist hotbeds worldwide, including the Philippines (observance of pre-9/11 Abu Sayyaf activity in the Philippines actually spurred the initiation of the MACHETE program.)

Remaining true to the program and an extremely apparent need, STAVATTI continued development of the MACHETE from 2001 to the present. Initiated as a private sector undertaking, the cost of MACHETE Research, Development, Testing & Evaluation (RDT&E) which would lead to the Low Rate Initial Production (LRIP) of the platform was to be provided by STAVATTI strategic partners. With a projected RDT&E cost of approximately $150 million, STAVATTI began negotiations with strategic partners for program funding during the fourth quarter of 2000. In March 2001, STAVATTI executed a formal agreement with a strategic partner/trust entity to result in the complete funding of the MACHETE program through a loan/revolving line of credit provided by Sahreya Group[2]/United Bank Of Kuwait. This loan/revolving line [redacted]

While the events of 9/11 have galvanized the need for counter insurgency orientated weapon systems, they also significantly quenched the open availability of investment/risk capital from late 2001 to the present. Immediately following 9/11, there was a distinct period wherein qualified accredited investors made very few new investments in any industry sector. The economy shuddered as America waited to see "what would happen next." During this time, STAVATTI continued MACHETE Detail Design on internal funds raised via private placements[4]. By 2002, the U.S. was fully engaged in combat with Al-Qa'ida insurgents in Iraq. We as a nation were combating the very type of adversary the MACHETE was being designed to root-out. Similarly, By 2003 the U.S. invaded Iraq and the MACHETE design was ready for prototyping and flight test as we entered a second era of counter insurgency.

Throughout the three years following 9/11, STAVATTI diligently worked to identify additional sources of private sector financial capital in lieu of Sahreya Group as engineering/design progressed. Modifying the business model to accommodate the possibility of USG RDT&E participation, STAVATTI offered the MACHETE platform in response to a variety of potentially applicable DoD bid opportunities including:

On 20 December 2001 STAVATTI submitted a Proposal/Quad Chart entitled: SM-27 MACHETE COunter-INsurgency (COIN) Platform under BAA 02-Q-4655, Requirement Number 310/DA-310-STAVATTI-01 for the Direct Action Mission Area. The total performance period was projected at 18 months with at total cost of $90.7 million. Resulting deliverables would include (3) SM-27 Prototype Air Vehicles, (2) SM-27 Vehicle System Simulators, 1,200 hours of flight test and associated data, 300 hours of wind tunnel test data and SM-27 production tooling. [redacted]

On 27 February 2004 STAVATTI submitted a Proposal/Quad Chart entitled: SM-27S MACHETE AS OA-10A SUCCESSOR IN COIN/FAC ROLE under BAA USA-SNOTE-040213-003. Two year program cost was $34.72 million and would have resulted in the delivery of (2) SM-27 Production Representative Test Vehicles, 600 hours of associated flight testing related data/documentation and (1) Full Motion SM-27 Simulator to the USAF. Submitted as a Continuing Effort under the Defense Acquisition Challenge Pro- [redacted]

U.S. armed forces are now engaged in fighting two wars of insurgency, yet since the initiation of both the Afghanistan and Iraqi campaigns there have been no new domestic requirements for a dedicated COIN platform. Furthermore, new combat aircraft procurement has not been a major priority over the past twelve years[5]. As such, there has been few DoD solicitations for new combat aircraft, nor RFPs for COIN/CAS/FAC platforms for which the MACHETE could serve as a potential candidate. Therefore the [redacted]

Although there has been no published domestic need for a dedicated next generation COIN/FAC for the U.S. inventory, outside the U.S. such a need became readily apparent through customer needs that have been brought to the attention of STAVATTI throughout the MACHETE program. Such official needs include direct inquires from the Philippines, Israel, Turkey, and most recently Colombia.

III. IMMEDIATE CUSTOMER NEEDS

PHILIPPINES

STAVATTI began marketing the F-26A STALMA Multi-Role Fighter to the Philippine Air Force (PhilAF) in 2000 to replace current PhilAF F-5A Freedom Fighters and significantly increase their capability as to properly address 21st century air defense needs. In the course of marketing the F-26A, Philippine Department of National Defense (PhilDND) officials indicated an additional need for a light attack/COIN aircraft to assist in suppressing armed southern rebels currently engaged in terrorist activities against the Philippine Government.

Prior to 2000, the PhilAF employed 21 Rockwell OV-10A Broncos in the COIN/FAC/light attack role against southern insurgents. As of January 2005, it is estimated that 20 OV-10Bs are operational within the PhilAF. Specifically, the PhilAF requires a COIN/light Attack aircraft to supplement existing OV-10As and replace other OV-10As which have been lost due to attrition. The PhilAF OV-10As have been operated by the 16th Attack Squadron of the Philippine Air Force, which prior to engaging southern rebels had such additional duties as performing maritime patrol over the Spratly Islands, forest protection, rainmaking via cloud seeding, and Search and Rescue (SAR).

The PhilAF has operated OV-10As for 26 years. The 16th received their OV-10As in 1992, replacing their AT-28Ds which they had been flying since 1972. With an anticipated requirement for an initial 15 to 25 aircraft by 2003 and up to 50 aircraft by 2010, it was this envisioned PhilAF need which aided in stimulation of MACHETE development. As noted, the nature of this PhilAF requirement was adjusted after 9/11. While the PhilAF yet requires an OV-10 Bronco replacement, the war on southern insurgents has [redacted]

[redacted]

lowing evaluation of conformal MACHETE Prototypes /Demonstrators.

ISRAEL

[redacted]

in a light attack role and providing unique anti-armor capability previously unavailable. Serving as an intermediate alternative attack aircraft to fill the gap between AH-1S SUPERCOBRA attack helicopters and A-4N SKYHAWKS, the SM-27S is significantly well suited to addressing the threats which drive regional unrest.

[redacted]

TURKEY

[redacted]

that the government of Turkey is in the process of developing requirements and specifications for a next generation Advanced Trainer and Light Attack aircraft, which the MACHETE could potentially satisfy. Turkey presently operates approximately 60 CESSNA T-37 aircraft (40 T-37C and 20 T-37B) in this role, as well as 38 SIAI-MARCHETTI SF-260Ds. The SM-27 could offer an improved platform to succeed these aircraft while providing a significant COIN capability to a nation faced with internal strife. In so doing, the MACHETE would provide Turkey, a NATO ally, a valuable tool in their internal war on terror, as well as

[redacted]

COLOMBIA

On 23 November 2004, the Colombian Air Force-Fuerza Aerea Colombiana (FAC) issued a Request For Proposal (RFP) for 24 Light Turboprop Attack Aircraft suitable for OV-10 and A-37 replacement. This contract is valued at approximately $234.56 Million and will include the procurement of aircraft and related support equipment. It is understood that this FAC contract is intended to result in the fielding and Initial Operational Capability of 24 suitable Light Turboprop Attack Aircraft by 2006-2007.

This Colombian RFP was summarily withdrawn for modification in mid-December with anticipated re-release the week of 31 January 2005 to include both an English language translation and a provision to accept turbofan submissions. As of the date of this program paper, STAVATTI was awaiting release of the revised FAC RFP in order to prepare submissions to potentially satisfy their turboprop (via the SM-27S MACHETE) and turbofan (via the SM-47 SUPER MACHETE, a product of STAVATTI HEAVY INDUSTRIES, and a derivative MACHETE platform beyond the scope of this document) requirements.

STAVATTI was first informed of a future Colombian requirement for new turboprop light attack/COIN aircraft for anti-narco operations and suppression of Marxist insurgents in fourth quarter 2003. At this time STAVATTI was encouraged to register with appropriate agencies in Bogota as a contractor capable of satisfying Colombian Ministry of Defense requirements. In early 2004, STAVATTI established our first in-country foreign marketing office for the MACHETE program, appointing Manuel J. Nieto as Resident Manager of Marketing-Colombia. Mr. Nieto initiated contact with relevant Colombian Ministry of Defense offices, promoting the MACHETE with previously released, public domain marketing material.

Anticipating the release of a FAC COIN RFP during 2004, on 21 May 2004, STAVATTI (DTC Code: 040513189) submitted a request for prior approval from the U.S. State Department, Office of Defense Trade Controls, to conduct marketing and submit proposals to Colombia for the sale of SM-27 MACHETE™ aircraft. This request was made per the requirements of ITAR §126.8, with the STAVATTI submission being assigned case number GC-0575-04.

On 28 June 2004, STAVATTI CEO Beskar had an informal meeting at the Colombian Embassy in Washington, D.C. with Col. Carlos Ruales and Technical Chief Julio Cesar Rodriguez, both of the Colombian air Force Attache. During the meeting Mr. Beskar provided a public domain presentation regarding the MACHETE as a potential candidate to replace FAC OV-10s and A-37s. The presentation resulted in the exploration of the STAVATTI marketing CD-ROM and subsequent encouragement to contact both Gen. Lesmez, Commander Air Force and Gen. Behar, Chief of Air Operations, in Colombia. Interestingly, on this same day the Colombian Ministry of Finance approved a budget of approximately $240 million USD for the procurement of 24 new light turboprop attack aircraft.

On 30 September 2004 STAVATTI began formal communication with Americo Rios, Senior Commercial Specialist with U.S. Commercial Service/U.S. Embassy in Colombia. Mr. Nieto subsequently met with Commercial Counselor Larry Farris and Commercial Attaché Geoffrey Bogart to discuss the details of a possible negotiation for the procurement of the MACHETE aircraft by FAC. The U.S. Commercial Service in Colombia, as well as Col Jay Schell, Chief, USAF Mission Colombia have subsequently been of assistance/in support of STAVATTI's FAC MACHETE proposal effort.

On 1 October 2004 STAVATTI was one of two U.S. Contractors (including RAYTHEON) shortlisted by FAC to respond to a relevant turboprop attack aircraft market study/RFI #1594 JEMFA-GPAC-486. It is perceived that prompting of relevant FAC personnel by Mr. Nieto in conjunction with the U.S. Commercial Service to review the STAVATTI website resulted in this immediate shortlisting. STAVATTI responded to this RFI with Public Domain STAVATTI marketing information on 11 October 2004.

This submission resulted in the STAVATTI MACHETE being identified as a potential candidate platform for FAC and subsequent mention of STAVATTI in local Colombian media publications (EL TEMPO). This in-turn resulted in numerous inquiries in support of the MACHETE, including those from current and former pilots of FAC A-37Bs, T-37Cs and Mirage 5s. The overall response from reviews made by current FAC pilots can be summarized by that of former Kfir C-2/C-7 Instructor Pilot Juan F. Cajiao: *"if every single number about Machete is true and all the capacities, capabilities and offerings are true, according to my knowledge, you must be the winner by far. Congratulations for such a superb machine."*

On 12 November 2004 Mr. Nieto attended a pre-solicitation meeting held by the Ministry of Defense to discuss the details of required specifications and to receive response to specific bid questions. Based upon an email received on 5 November 2004 sent to STAVATTI by Commercial Counselor Larry Farris, it was anticipated that “Final specs (for the FAC requirement) will be available for consultation and/or purchase for 3 million Col. pesos as of November 23rd. By March of next year, a decision should have been made by government officials as to the type of aircraft to be acquired and a purchase contract process could be completed by July 20th, 2005. In one or two years the new aircraft should arrive in Colombia depending on their availability.”

Based upon the interpretation of Larry Farris, it is apparent that FAC desires IOC of the new Tuboprop Light Attack Aircraft to begin in 2007, pending availability

Also on 12 November 2004, STAVATTI was contacted by an export finance bank. The export finance bank has had a strong position in regard to working with the Colombian Ministry of Defense, having closed on a financed drug interdiction project for Colombia in 2000, with anticipation in closing on a second Colombian MoD related financing program prior to the close of 2004. Recognizing STAVATTI as a strong candidate for the FAC COIN requirement, the export finance bank indicated their support of STAVATTI for the financing of the sale of 24 aircraft worth $235 million to the Colombian Ministry of Defense. This financing would provide the Colombian MoD with the financial instrument necessary to procure the said aircraft. Following the execution of relevant PIAs on November 23rd STAVATTI began working with the export finance bank as the “customer financing” arm of a MACHETE RFP submission.

On 23 November 2004 FAC issued an RFP for the 24 Turboprop Light Attack Aircraft valued at $234.56 million USD. The RFP is designated 05/CE 04 MDN-FAC. Responses to the RFP were to be submitted by 10:00 AM on 20 December 2004. This RFP was withdrawn by mid-December as stated earlier.

STAVATTI perspective, the potential Colombian contract represents a clear indication that the MACHETE aircraft is not only NEEDED, but DESIRED. Recognizing these factors, on 1 December 2004 STAVATTI Issued a White Paper, SD-272279-WP entitled SM-27 MACHETE For FMS COIN/CAS/FAC.

The White Paper was followed by intense rallying with MACHETE Industry Team Members, including powerplant, armament and avionics suppliers directed toward responding to the anticipated FAC RFP.

Prior to being invited to participate in the FAC market study, appropriate FAC personnel did review the MACHETE profile on the STAVATTI website. Within that profile, it is fully disclosed that the MACHETE is yet under development, with LRIP expected to begin in 2007. As such, it should be evident to all involved in reviewing the MACHETE program that production units will not be delivered until 2007, provided the development program which necessitates that production, flight test and certification of prototype air vehicles, occurs in a timely fashion. The status of the MACHETE program was also indicated in the market study response provided to FAC. Despite the fact that the MACHETE is clearly not yet in-production, there is distinct interest by FAC in the possible procurement of the MACHETE as evident in the shortlisting of STAVATTI. This interest is likely driven by the apparent technical superiority of the MACHETE platform and the promise offered by the design as a truly advanced and capable COIN platform. Such aspects were undoubtedly recognized by the FAC procurement and evaluation organization.

STAVATTI has a product which could theoretically win the FAC contract award based upon superior performance and technical capability. STAVATTI has been informed that a technical committee will evaluate all aircraft candidates using the following weighting: 70% technical characteristics (range, speed, ceiling, weapons capability, test flight results, etc.) and 30% economic factors (purchase price, support package, etc.)[7]. Furthermore, in 2005, the Colombian Air Force Commander desires to have prospective contractors bring a demo aircraft to Colombia for flight evaluations and actual ordnance drops.

[redacted]

Rate Initial Production (LRIP). LRIP scheduling permits a gradual ramp-up to a Full Production Rate within two years, whereby 15 production aircraft will be delivered within the first year of LRIP and over 25 aircraft delivered within the second year. Total production rate is estimated at 50 aircraft annually by 2009 under this schedule. Satisfying the requirement to begin delivery within two years of contract award, the first 15 MACHETE aircraft would be delivered by July 2008 with the entire fleet of 24 aircraft delivered and in-service by January 2009.

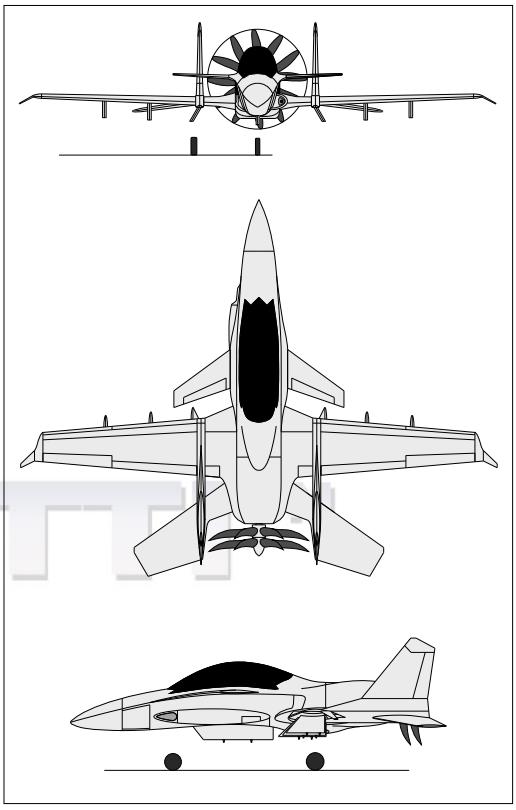
The MACHETE does not presently have a backlog, hence all initial production activity can be focused upon satisfaction of the Colombian contract. PILATUS, RAYTHEON and EMBRAER, however, undoubtedly have a backlog. Provided any of those aircraft manufacturers are awarded the FAC contract, current backlog may be on-the-order of two to three years. It is theoretically possible that STAVATTI could complete prototype assembly, flight test, qualification and have initial aircraft delivered to FAC before the the backlog of an alternate contractor to become sufficiently free to initiate work on the assembly of aircraft specifically for Colombia. Although STAVATTI is subject to backlogs on the system/component level (it requires approximately 9 to 18 months to receive new turboprop engines, etc.), with a contract-in-hand, STAVATTI will be able to order production components during MACHETE flight test and Certification, assuring their arrival upon initiation of LRIP.

[redacted]

IV. SM-27 MACHETE AIRCRAFT OVERVIEW

The **SM-27** is a single engine, single seat (SM-27S) or two seat tandem (SM-27T) COIN, Light Attack, Forward Air Control (FAC) and Advanced Trainer (AT) platform. Optimized for the Close Air Support (CAS) role, the MACHETE has been designed for the decisive suppression of entrenched terrorist and insurgent forces. Featuring a three-surface arrangement consisting of a high aspect ratio wing, low aspect ratio canard foreplanes and an all-moving horizontal tail, the MACHETE is developed for conventional ordinance delivery at low altitudes and low speeds. Armed with a single 30mm Oerlikon KCA cannon, all MACHETE variants offer seven hardpoints for the delivery of up to 5,250 lbs of external stores/ordinance.

MACHETE primary structures consist of Scandium Aluminum, IM9/RP-46 Graphite/Polyimide, Ti-6A1-4V Titanium and SPECTRA/RP-46 SPECTRA/Polyimide. Aircraft service life is projected at 15,000 hours.



The MACHETE fuselage is a single piece, modular unit composed of a unitized graphite epoxy body and aramid radome and cowling sections. Enhancing structural rigidity, the fuselage body incorporates a titanium subframe of geodetic construction (pioneered in the Wellington Bomber) integrating all frames, primary bulkheads and firewall. Armored throughout, the MACHETE features a titanium armor “bathtub” for cockpit protection as well as an armored ammunition cell and internal self-sealing fuel tanks. The fuselage centerline features a single dorsal hardpoint for stores carriage.

SM-27 MACHETE wings are of high aspect ratio, cantilever low-wing type. Mean Wing airfoil is a NACA 65(2)-415 throughout the span with 2° washout and winglets. The wing is a fail-safe structure with two spars. Each wing is equipped with ailerons, spoilers and double slotted Fowler flaps.

The wings, along with all aircraft lifting surfaces, feature piezoelectric deicing. Each wing contains self-sealing fuel tanks and three stores hardpoints, two of which are plumbed for external drop (fuel) tanks.

The MACHETE canard foreplanes are fixed, close coupled, cantilever lifting type with a NACA 65-209 section. With stainless steel spars and aluminum skins, the canards incorporate elevators that operate collectively with the all moving slab horizontal stabilizer to enhance pitch rate. The MACHETE empennage consists of an all-moving horizontal stabilizer and twin vertical stabilizers. The empennage is mated to MACHETE via a wing mounted integrated boom support structure and fuselage braces which blend directly into the horizontal stabilizer. The horizontal tail employs a NACA 0009 airfoil, three titanium spars and graphite/polyimide ribs and skins. MACHETE vertical stabilizers are of trapezoidal configuration with dorsal fairings. Vertical stabilizer mean airfoil is a NACA 0009 section with each unit having scandium aluminum spars and Spectra/polyimide skins. Each vertical tail has a dielectric tip fairing for EW and RWR.

The SM-27 is powered by a single Pratt & Whitney PW127G free turbine propulsion engine developing 2,920 SHP at a shaft output of 1,200 RPM with an SFC of 0.459. The powerplant drives a six blade, reversible, constant speed contra-rotating propeller of Scimitar type. The powerplant is arranged in the pusher configuration, with mass flow supplied by lateral fuselage mounted normal shock inlets. JP-8 fuel is delivered to the PW127G via a pressurized fuel delivery system composed of seven rigid self-sealing fuel tanks. Total SM-27S/T internal fuel capacity is 2,600 lbs. Fuel tanks are fitted with tear-resistant self-sealing cells lined with reticulated foam.

MACHETE cockpits are designed for reduced workload operations with crewmembers seated on unreclined Martin Baker US16L zero/zero ejection seats. The cockpit is pressurized to 8,000 ft, with standby pilot oxygen provided by a molecular sieve oxygen generating system (MSOGS). The MACHETE benefits from a birdstrike/bullet resistant clamshell canopy. All MACHETE variants benefit from a HOTAS flight controls arrangement consisting of a centrally mounted flight control column, full deflection rudder pedals, throttle, prop and flap levers. SM-27T models feature dual controls with the rear seat serving as the instructor station. All MACHETE™ cockpits employ a Sparrow Hawk WFV HUD and a fully integrated Multi-Functional flat panel LCD display system augmented by analog reference instruments. Suitable for VFR and IFR operations, the cockpit is Generation III night vision compliant.

SM-27 avionics are integrated about a MIL-STD-1553B Data Bus and include a comprehensive nav/com suite. Primary systems include the General Dynamics SMS 2100 for stores management, Rockwell Collins AN/ARC-210(V) multi-mode integrated communications system, Rockwell Collins MIS/LVT Low-Volume Link 16 terminal, Andrea AN/AIC-25 intercom, Raytheon AN/APX-100(V) IFF Transponder. Northrop Grumman AN/ASN-166 Embedded GPS/INS, Sierra Research AN/ARN-136A TACAN, Honeywell AN/ARN-127 VOR/ILS and Honeywell KR 87 ADF. The SM-27 may be equipped with a cost optional Elta EL/M-2001B air-to-air/air-to-ground radar or Honeywell RDR-2000 Color Vertical Profile Weather Radar.

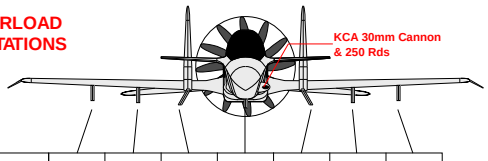
Standard SM-27 internal Electronic Counter Measures (ECM) consists of the Elisra SPS-20(V) Radar Warning System, Elisra LWS-20V-2 Laser Warning System, Elisra SPJ-20 Self Protection Jammer, Raytheon AN/AAR-58(V) Missile Warning System and BAE (Tracor) AN/ALE-47 dispensers.

SM-27 systems include hydraulically actuated, retractable tricycle landing gear. The main landing gear

consists of a wing mounted, single-strut, oelo-pneumatic, single wheel units featuring carbon disk brakes. Nose landing gear retracts forward and is an oelo-pneumatic, fork-braced single wheeled unit. Nose wheel steering, and main gear braking is provided. The landing gear is capable of unprepared, forward operations and sink rates of 15 ft/s. The MACHETE™ employs a conventional, manual, direct force-feedback flight control system. The SM-27 has positive dynamic and static stability and are fully aerobatic, able to stall, slip and spin. The MACHETE™ features a 4,000 psi hydraulic system. Hydraulic functions include landing gear extension and retraction, flap extension and retraction, canopy extension and retraction and internal cannon actuation. The SM-27 electrical system supplies 115 volt, three-phase, 400 cycle AC power and 28 VDC per MIL-STD-704D. Three independent sources generate power.

SM-27S internal armament includes a single Oerlikon Burle KCA Single-Barrel 30 mm cannon in the aircraft port fuselage. The cannon provides the MACHETE with anti tank/anti-aircraft capability. The cannon is provided with 250 rounds of either AP, HEI, SAPHEI or TP type. The SM-27T may incorporate the KCA and 250 round ammunition system, without reduction in internal fuel. The SM-27 may alternatively be fitted with the General Dynamics GAU-13 30mm cannon as well as a mix of 50 caliber and 7.62mm machine guns both internally and in external, wing mounted gun pods.

SM-27S/T WARLOAD & STORES STATIONS



STATION NUMBER	1	2	3	4	5	6	7
AIM-9 Sidewinder	X	X				X	X
AGM-65 Maverick	X	X	X		X	X	X
GBU-22/Mk.82	XX	XX	X	XX	X	XX	XX
GBU-32 JDAM/MK. 83	X	XX	X	X	X	XX	X
CBU-97/B SFW	X	XX	X	X	X	XX	X
BLU-107 Durandal	X	X	X	X	X	X	X
LAU-3 Rocket Pod	XX	XX	X		X	XX	XX
CBU-59/Rockeye II	X	XX	X	X	X	XX	X
SUU-11(GAU-2) Gun Pod	X	X	X	X	X	X	X
MK77 Napalm Bomb	X	X	X	X	X	X	X
ALQ-184(V) ECM Pod	X	X	X	X	X	X	X
100 U.S. Gallon Tank		X	X		X	X	
150 U.S. Gallon Tank		X	X		X	X	
230 U.S. Gallon Tank		X	X		X	X	
Hardpoint Rating @ 7.5g	1000 lbs	2500 lbs	2500 lbs	1000 lbs	2500 lbs	2500 lbs	1000 lbs

All MACHETE™ variants offer seven external stores hardpoints consisting of six wing mounted and one fuselage centerline mounted pylons equipped with NATO standard 14-inch and 28-inch lug suspension systems. The MACHETE™ is designed for air-to-ground missions, employing ordinance including the AGM-65, GBU-32, CBU-97, CBU-59, BLU-107 and additional stores. Air-to-Air capability is provided through the carriage of AIM-9 and similar passive homing/IR AAMs. The MACHETE™ is capable of LANTIRN pod carriage and employs a MIL-STD-1760 Weapon Interface Data Bus.

SM-27S empty weight is 7,120 lbs while MTOW is 15,500 lbs resulting in a useful load of 8,380 lbs including 5,250 lbs of external stores/ordinance and 2,600 lbs JP-8 fuel. SM-27S maximum level speed exceeds 350 kts @ sea level and 410 kts @ 15,000 ft. Maximum cruise speed is 360 kts @ 15,000 ft. SM-27S stall speed is 97 kts @ MTOW while maximum rate of climb is over 4,100 ft/min @ MTOW. Tactical radius on internal fuel exceeds 500 nm while maximum ferry range on internal fuel is over 1,500 nm. Performance is largely identical for the SM-27T which also features a 16,250 lb MTOW.

Principal SM-27 dimensions include a 43 ft 0 in span, 34 ft 0 in length, 12 ft 0 in height and a gross wing area (including lifting canards) of 196 sq ft. All SM-27s are equipped for in-flight refueling and are rated to a minimum +7.5/-3.0 g limit load @ MTOW. A CTOL aircraft, SM-27 takeoff and landing distances are less than 1,500 ft at MTOW.

A core program of STAVATTI, SM-27S mean per unit flyaway cost is estimated at between $6.0 Million and $9.0 Million, with SM-27T per unit flyaway cost estimated at $6.5 Million to $9.5 Million. The total system cost of equipped SM-27S aircraft, including contractor provided stores, spares and support equipment, as offered to FAC will be approximately $9.75 Million per unit package. For the purpose of this program paper, however, the per unit flyaway cost of the SM-27 MACHETE is standardized at $8.4 million. Unit flyaway cost of individual MACHETE aircraft may exceed $10 million dependent upon exact avionics and systems configurations.

The SM-27 MACHETE is projected to require approximately 8,000 man-hours to assemble at a final assembly facility requiring at least 150,000 sq ft to support an annual production rate of 50 aircraft.

EXTERNAL DIMENSIONS & AREAS (Provisional)

Overall Dimensions (All Models)

Span	43 ft 0 in
Length	34 ft 0 in
Height	12 ft 0 in
Gross Wing Area	196.4 sq ft

Wing (All Models)

LE Sweep	5º
Span	43 ft 0 in
Area	171 sq ft
Dihedral	2º
Incidence	0º
Aspect Ratio	10.9
Taper Ratio	0.44
MAC	4 ft 7 in
Mean Airfoil	NACA 65(2)-415

Canard (All Models)

LE Sweep	36º
Span (Unit)	5 ft 1 in
Area	25.42 sq ft
Dihedral	3º
Incidence	0º
Aspect Ratio	4.07
MAC	2 ft 7.6 in
Mean Airfoil	NACA 65-209

Horizontal Tail (All Models)

LE Sweep	35º
Span (Unit)	8 ft 2.25 in
Area	57.32 sq ft
Dihedral	-8º
Incidence	0º
Aspect Ratio	4.68
MAC	4 ft 6 in
Mean Airfoil	NACA 0009

Vertical Tail (All Models)

LE Sweep	40º
Span (Unit)	6 ft 6 in
Area	62.45 sq ft
Dihedral	90º
Incidence	0º
Aspect Ratio	1.42
MAC	5 ft 1.43 in
Mean Airfoil	NACA 0009

Landing Gear (All Models)

Wheel Base	12 ft 11 in
Wheel Track	11 ft 4 in
Nose/Main Weight Dist.	21%/79%
Nose Tire	(1) 18 x 4.25-10
Main Tires	(2) 19.5 x 6.75-8
Nose Tire Pressure	100 psi
Main Tire Pressure	110 psi

INTERNAL DIMENSIONS (Provisional)

SM-27S MACHETE (Single Seat)

Cabin Length	64 in
Cabin Height-Maximum	64 in
Cabin Width-Maximum	32 in

SM-27T MACHETE (Two Place Tandem)

Cabin Length	131 in
Cabin Height-Maximum	64 in
Cabin Width-Maximum	32 in

WEIGHTS & CAPACITIES (Provisional)

SM-27S MACHETE (Single Seat)

Dry Empty Weight	7,120 lbs
Aircraft Operating Weight	7,650 lbs
Maximum Useful Internal Fuel	2,600 lbs (JP-8)
Maximum External Load	5,250 lbs
Maximum Gross Takeoff Weight	15,500 lbs
Design Load Factor @ MTOW	+7.5/-3.0

SM-27T MACHETE (Two Place Tandem)

Dry Empty Weight	7,610 lbs
Aircraft Operating Weight	8,400 lbs
Maximum Useful Internal Fuel	2,600 lbs (JP-8)
Maximum External Load	5,250 lbs
Maximum Gross Takeoff Weight	16,250 lbs
Design Load Factor @ MTOW	+7.2/-2.9

PERFORMANCE & LOADINGS (Provisional)

Performance estimates are based upon a standard SM-27S aircraftvat CTOW or MTOW. MTOW configuration representative of a load including 2 x GBU-31 and 2 x GBU-38 under ISA, standard day conditions. Takeoff and landing field lengths are based on level, hard surface runways with zero wind. Ferry range is unarmed with external tanks.

Max Level Speed @ SL-CTOW	350 Kts
Max Level Speed @ 15,000 ft-CTOW	403 Kts
Max Cruise Speed @ 15,000 ft -CTOW	360 Kts
Maximum Dive Speed-CTOW	504 Kts
Max Level Speed @ SL-MTOW	332 Kts
Max Level Speed @ 15,000 ft-MTOW	379 Kts
Max Cruise Speed @ 15,000 ft-MTOW	334 Kts
Maximum Dive Speed-CTOW	474 Kts
Stall Speed Flapped @ SL-CTOW	79 Kts
Approach Speed Flapped @ SL-CTOW	87 Kts
Stall Speed Clean @ SL-CTOW	103 Kts
Stall Speed Flapped @ SL-MTOW	97 Kts
Approach Speed Flapped @ SL-MTOW	107 Kts
Stall Speed Clean @ SL-MTOW	127 Kt
Best Climb Speed @ SL	120-130 Kts
Max Climb Rate @ SL-CTOW	7,050 ft/min
Max Climb Rate @ SL-MTOW	4,100 ft/min
Service Ceiling Exceeds	44,000 ft
Tactical Radius; 20 min at Target-MTOW	575 nm
Range, Internal Fuel-CTOW	1,530 nm
Ferry Range, External Fuel-MTOW	3,600 nm
Takeoff Distance-SL-MTOW	1,678 ft
Landing Distance-SL-MTOW	2,081 ft
Max Wing Loading (lbs/sq ft)	83.0
Max Power Loading (lbs/shp)	5.6
Design Load Factor-CTOW	+11.3/-5.7
Design Load Factor-MTOW	+7.5/-3.75

V. MACHETE MISSION & THE NATURE OF COIN

The SM-27 MACHETE is the COIN/CAS/FAC/AT platform for Joint-Vision 2025. Developed for procurement principally between 2010 and 2040, the SM-27 MACHETE is a from-the-ground-up, “Generation Next” SUPER COIN solution. The MACHETE is the only original COIN turboprop developed since 1978.

Although there are numerous examples of primary and advanced trainer aircraft which can be converted to satisfy the COIN role (including the Aermacchi SF.260M, Aerospatiale TB 30 Epsilon, Beech T-34C Turbo Mentor, Embraer EMB-312/314 Tucano/Super Tucano, North American T-28D Trojan, Pilatus PC-7/PC-9 and KAI KT-1 to name a few), there are only five aircraft in service today which were developed as dedicated COIN platforms: the Cessna A-37B Dragonfly, the Lockheed Martin Aircraft Argentina (formerly FMA) IA-58 Pucar’a, the Northrop Grumman (formerly Fairchild) A-10A Thunderbolt II, the Boeing (formerly Rockwell International) OV-10 Bronco and the Sukhoi Su-25 Frogfoot. Although these five aircraft are in service with air forces worldwide, only one, the Su-25 Frogfoot, is currently being produced in significant quantities.

The COIN mission is one aspect of Close Air Support (CAS). CAS consists of “air attacks against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces.[8]” In accordance with the 1956 edition of the USAF Dictionary, CAS is the “air support or cooperation provided friendly surface forces, consisting of air attacks with guns, bombs, guided airborne missiles or rockets on hostile surface forces, their installations or vehicles so close to surface operations as to require detailed coordination between air and friendly surface forces.” CAS can be defined as the use of airpower to attack hostile ground forces which are already in contact with friendly troops, or are at the point of engaging them. CAS has played a major role in every armed conflict of the 20th century. From the use of Sopwith Camels of the Royal Flying Corps in close support of the Royal Tank Corps at Bapaume in 1918, to the Luftwaffe use of Stukas to provide close support of Heer ground forces during the Blitzkriegs of WWII, CAS is an integral component of air war.

Following the Korean War, where CAS missions flown by F-51s, F-80s, F-84s, F7Fs, F9Fs, F4Us and A-26s played a major role in dispatching North Korean ground forces, President Eisenhower resolved that the US would never again become bogged-down in a war (like Korea) where the full brunt of American power could not, or would not, be applied. Subsequently, post Korean War strategists streamlined the armed forces to focus upon nuclear combat with only secondary emphasis placed upon conventional war fighting capability. Until 1960, the USAF concentrated upon conducting nuclear war, believing that nuclear capability could address any conflict of any magnitude, thereby eliminating CAS as a core component of air war.

In 1960, however, the Kennedy Administration came to power and the concept of conducting limited, conventional wars with implied restrictions on American power (which Eisenhower had opposed) was reintroduced and considered a legitimate doctrine.

Under the Kennedy Administration, it was believed that the best way to thwart communist world domination was to provide developing free peoples in allied third world nations with ample light weapons and adequate hands-on training via US military advisors. In so doing, it would be possible not only to defeat

the numerous rebel groups and Soviet-inspired 'insurgents' attempting to topple fledgling democracies, but to stop the spread of communism without resorting to nuclear weapons. Moreover, developing allied nations could counter unsophisticated internal threats using their own limited forces without requiring the direct involvement of US troops. As a component of this new acceptance of limited warfare, CAS was revived by the Kennedy Administration as a way of defeating Marxist guerrilla type forces using limited effort in an unsophisticated air environment. Under Defense Secretary McNamara, a new acronym took residence under the CAS umbrella: COIN. The concept of the COIN had been developed after protracted DoD studies which began in 1958 in consideration of crises in Quemoy and Lebanon. The COIN mission is to defeat insurgent forces in collaboration with friendly ground troops[9]. This combined reemergence of limited war as a valid strategy and CAS as a valid air war doctrine was just-in-time for Vietnam.

The Vietnamese Air Force (VNAF) came into being in 1951 as a component of the French Air Force. From 1950 to 1957, the US provided financial assistance to the French structured VNAF. Following the French departure from Vietnam in 1957, the US government assumed a military advisory position to the VNAF. Lacking both aircraft and trained pilots[10], under the US Military Assistance Program (MAP) President Eisenhower sent six A-1H Skyraiders and eleven H-34 Helicopters to the VNAF in 1960 to replace the F8F Bearcats which were grounded in 1959 due to mechanical failure. Eisenhower's pledge of support for the VNAF was nothing, however, compared to the support in 1961 from the Kennedy Administration.

Beginning with considerably increased assistance to South Vietnam, in 1961 the US delivered more A-1Hs as well as armed T-28Ds for the VNAF. Although the VNAF established a Tactical Air Command in 1956, tactical air strikes did not begin until 1961, and only after gaining approval from the Army of the Republic of Vietnam (ARVN), the Tactical Operations Center (TOC), the Joint Operations Center (JOC) and finally by President Diem. This system was slow and inefficient and defined the basis by which all combat, both by South Vietnamese and future US forces, would be conducted. As a component of MAP, in 1961 the USAF 4400 Combat Crew Training Squadron (CCTS), code named JUNGLE JIM, based at Eglin AFB began training to react to brush fires anywhere in the world.

In October 1961 the 4400 CCTS dispatched a unit, code named Farm Gate (consisting of 154 men and 16 aircraft including 8 T-28s, 4 SC-47s and 4 RA-26s), to Bien Hoa Air Base in South Vietnam. The primary mission of Farm Gate was strictly limited to training the VNAF in tactical air operations, with all Farm Gate aircraft operating with VNAF insignia and a VNAF trainee-observer. The first armed mission by Farm Gate was in November 1961.

To conduct the armed mission, Farm Gate operated four T-28D Nomads. COIN operations against concealed North Vietnamese ground troops called for the accurate delivery of small weapon loads, which during 1961 (due to limited technology) required using aircraft with good maneuverability at low speed. North American had created such a light combat aircraft called the T-28D Nomad; a strengthened, re-engined version of the T-28A Trojan trainer. By 1963 Farm Gate's inventory was raised to 18 A-26s and 13 T-28Ds.

Independent of Farm Gate, the VNAF operated T-28Ds and A-26s exclusively in the CAS role. Between 1963-1964 T-28D losses increased steadily, which many TAC COIN analysts blamed on the type's low speed. Gradually, the Kennedy Administration was learning that the Viet Cong was not a primitive threat, but instead was becoming extremely proficient with Soviet supplied 12.7mm anti-aircraft guns. In 1964 a tri-service requirement for a T-28D successor aircraft, known as the Light Armed Reconnaissance Aircraft (LARA), was sponsored by the USMC. The LARA was to be built in significant numbers for the USAF, USMC, USN and US Allies. The need to replace the T-28D became a matter of urgency, however, by February of 1964 when the VNAF A-26 fleet was grounded and subsequently withdrawn due to wing structural failure.

With LARA production several years out, the USAF and VNAF was provided with USN Douglas A-1H and A-1E Skyraiders to replace the T-28D and A-26 Invader. Over 1,000 A-1s were sent to Vietnam until withdrawal in 1973. The A-1 proved to be the war's most successful CAS platform. The A-1 offered excellent visibility, a ten hour endurance, tremendous stores carriage capacity and good low level maneuverability. The aircraft was so useful that the USAF considered reopening the production line[11].

A tough aircraft which could remain on station long after a jet would have been out of fuel, the only shortcoming of the Skyraider was its relatively low maximum speed, which resulted in occasionally unacceptable response times to target.

In 1965, the VNAF (at the request of General Westmoreland) lifted both the ban on the use of US jet aircraft in Vietnam, as well as the requirement that all US aircraft carry a VNAF observer during missions6. Once the ban on jet aircraft was lifted, TAC began operating F-100 Super Sabres and F-4 Phantoms in the CAS role. The use of high performance jets for the CAS mission proved less than ideal, however, due to their relatively short loiter time and poor maneuverability at low level. Furthermore, fast jet pilots encountered difficulty acquiring small, fleeting targets over the environment of canopy jungle while traveling at high speeds.

Seeking alternatives to fast jets, the US introduced the A-37B Dragonfly. In 1962 the USAF's Special Air Warfare Center began evaluating two highly modified YAT-37D aircraft, derivatives of the Cessna T-37 Tweet jet trainer, to serve as COIN platforms. Although testing proved positive, it wasn't until the intensification of the Vietnam War in 1966 that the Cessna A-37 Dragonfly (resulting from the YAT-37D) entered production and service with both the USAF and VNAF. The A-37 was a forgiving aircraft and easy to maintain. Moreover, VNAF pilot cadets usually trained in the T-37, making the transition to the A-37 uncomplicated.

The A-37 did not have the A-1 Skyraider's endurance, however, and had to be kept on the ground until needed. Too often, the A-37 arrived on the battlescene too late where its pilots found that the tactical situation had changed. A total of 550 A-37s were produced between 1966 and 1976, with a number of aircraft being exported to US allies. There are an estimated 140 A-37s still in service today in air forces worldwide, including the Colombian Air Force.

By 1968 the USAF and VNAF began receiving the platform which resulted from the LARA program: the OV-10A Bronco. Built by Rockwell International, the Bronco was designed specifically to fight limited 'brushfire' wars and entered the LARA competition as the North American NA-300. Considered as the world's first dedicated COIN platform, the OV-10 was introduced as a prototype in 1965 and entered production in 1967. A two place tandem aircraft (allowing the presence of a VNAF observer), the Bronco was a twin turboprop design which offered good short-field capability and the ability to carry up to five paratroopers/3,200 lbs of cargo in a unique aft bay.

When originally conceived, the OV-10 Bronco was intended to replace the T-28D Trojan. By the time the OV-10 entered service in 1968, it was realized that Vietnam was not simply a 'brushwar' being fought between the South Vietnamese and primitive rebels, but a major armed conflict in which the US was committing significant troops and material. The 'brushwar' had escalated and rather than being a battle against poorly armed insurgents, the North Vietnamese were an extremely capable threat.

The OV-10 was found to be completely incapable of countering threats posed by the North Vietnamese, with TAC considering it far too slow for the CAS/COIN mission. Instead the OV-10 used strictly in the Forward Air Control (FAC) role, dedicated to marking targets for annihilation by heavy fast jets capable of delivering far greater warloads. Despite its inability to serve as the end-all platform to fight limited 'brush fire' wars, a total of 271 OV-10s were subsequently delivered to the USMC and USAF, with several additional aircraft being exported to US allies worldwide. An estimated 90 OV-10s are still in-service worldwide with allies including Colombia, the Philippines, Thailand, Venezuala and internally with the BATF and BoI.

Throughout the 1960s, foreign governments, concerned with insurgents began considering their own COIN requirements. Central and South American air forces in particular began procuring examples of Cessna A-37Bs and Rockwell OV-10s in the late '60s and '70's to satisfy COIN needs. Alternatively, Argentina developed an indigenous, dedicated COIN aircraft to dispatch guerrillas: the FMA IA-58 Pucar'a. The Pucar'a was designed to satisfy a 1960's Argentine Requirement for a COIN platform. The Pucar'a first flew in prototype form in 1969 and entered production in 1974, with deliveries beginning in 1976. Immediately upon deployment in 1976, the Pucar'a went to work engaging rebel groups in North West Argentina. While successful against rebels, out of 24 Pucar'as deployed against the British Royal Navy in the 1982 Falklands War, all were either destroyed in the air or sabotaged by the SAS, with the exception of one which was captured, evaluated by the RAF and subsequently interned as part of the Imperial War Museum collection.

The original requirements for COIN aircraft (specifically those of the LARA) were based upon applying the strategies associated with fighting a Limited War to Southeast Asia. The Vietnam War was considered the ideal laboratory to test-out theories on how to successfully fight a limited conflict. The OV-10 was developed with the belief that such an aircraft used in conjunction with U.S. trained South Vietnamese ground forces could suppress offenses made by the North Vietnamese. The OV-10 was created to serve as the ideal COIN platform. In reality, the A-1 Skyraider developed in 1944 was far more suitable to satisfying the COIN role than the OV-10. Hence, the payload and endurance of the A-1 became the baseline for 1965-66 studies investigating the requirements of a Super-COIN aircraft to replace the OV-10. Additionally, the sophistication of the Viet Cong indicated that any future COIN aircraft must be able to destroy heavy targets and survive against more sophisticated defenses than had been envisioned in 1960.

In 1966, the need for a USAF Super-COIN aircraft forged the Attack, Experimental program (AX). Directed under General John P. McConnell, an RFP was released by the USAF in 1967 requesting industry concepts for the A-X. The concept behind the A-X was to combine the A-1s endurance and weapon load with a minimum speed of 350 Kt (the A-1 was limited to 240 kt) with full external load.

Despite the increased speed, the A-X was to maneuver hard at low airspeeds. The speed of the A-X would not be enough to avoid groundfire, however, so the aircraft would have to have an enormous degree of survivability. Furthermore, the aircraft had to operate from short, forward airstrips and offer a low unit flyaway cost. The A-X specification called for an aircraft to be powered by either turboprop or turbofan engines. The Arab-Israeli wars of the late '60s, however, enhanced USAF thinking about CAS, indicating that any future CAS/COIN platform must also dispatch tanks. Consequently, the A-X aircraft was to display maximum lethality against armored targets and be able to achieve this lethality with the first round fired or the first store dropped.

A final A-X RFP was issued in May 1970 calling for an aircraft with a speed of 350-400 kt and a maximum external load of 16,000 lbs. The A-X had to carry a 9,500 lb weapon load over a 250 nm radius and loiter for two hours in the target area. AX was to operate safely in poor weather, specifically with a 1,000 ft ceiling and 1 mile visibility. The RFP response deadline was August 10, 1970. Six companies responded: Cessna, Boeing-Vertol, Fairchild, Lockheed, General Dynamics and Northrop.

The USAF announced four months after RFP closing date that Northrop and Fairchild were selected for DEM/VAL and each would build two A-X prototypes. Northrop's contract was for the YA-9A and was worth $28.9 million. Fairchild was selected to build the YA-10A and was awarded $41.2 million. The cost disparity was because Northrop was building a non-conformal prototype, while Fairchild was building a near production representative, conformal prototype. The YA-10A was the first to fly on May 10, 1972. On January 18, 1973 the USAF announced the selection of the A-10 and a $159 million contract was awarded to Fairchild to build six Development, Test and Evaluation aircraft (DT&E).

The first production A-10A, designated the Thunderbolt II, flew on October 21, 1975. Most A-10s produced were not applied to satisfying a 'brushwar' COIN role, however, and were assigned to western Europe to destroy Soviet Tanks in the event of a European conventional conflict and/or WWIII. Considered first-and-foremost as an anti-tank weapon, the A-10A had enormous success in the Gulf War destroying Soviet Supplied Iraqi Tanks. A total of 721 A-10As were built for the USAF, the final unit being delivered on March 20, 1984.

Satisfying a similar requirement as the A-X, in 1968 the Soviet Union began development of a CAS platform to satisfy the COIN and anti-tank role. Designated the Su25 Frogfoot, in 1975 a prototype of this platform took to the air. Produced by Sukhoi, the Su-25 was used extensively in Afghanistan against the Mojahedin during the 1980's. Operated throughout the Soviet (and now Russian) Air Force as an anti-tank platform over 600 Su-25s have been produced. Exported throughout eastern Europe and to overseas customers including Afghanistan, Angola, Iraq and North Korea, the Su-25 is currently in production.

Although the A-10 was originally developed as a Super-COIN platform, the A-X program shortly became focused upon the anti-tank role, rather than a solution to CAS problems faced during Vietnam. Despite being produced in large numbers, the A-10 was never sold outside the USAF. Although extremely well-built, highly maneuverable and capable of surviving at low airspeeds, low altitudes and from forward locations, the A-10 is a relatively expensive, at approximately $18 million each. While the A-10 does in-fact make an excellent COIN aircraft, it is very seldom classified as a COIN weapon, instead being considered far too expensive and far more complex for service within air forces of limited means who may be engaged in anti-rebel combat. Similarly the Su-25 Frogfoot, while very suitable for the COIN role, is too large, too complex, and at $11 million, often too expensive to be considered a low cost COIN platform. Though suitable for replacement by F-16s equipped with GPU-5 Pave Claw 30mm cannon pods, the A-10 is gradually being withdrawn from service, with 116 A-10s being assigned to the FAC role as OA-10s. Assessing the A-10 weapon system, it becomes apparent that the true Super-COIN requirements of the 1966 A-X program were never actually satisfied. STAVATTI views the MACHETE as the solution to the Super-COIN requirement as originally specified.

The MACHETE is envisioned as the sole, all-new, dedicated low-cost COIN aircraft for service within the 2010-2040 time-frame. Today there does not exist a truly effective, dedicated COIN aircraft which can counter rebels at low altitude, from forward airfields, at a reasonable unit flyaway cost. The MACHETE program is significant as it will result in such an aircraft. With the exception of the IA-58 and very high end COIN platforms including the A-10 and Su-25, the youngest COIN aircraft in the world inventory are already 25 years old. COIN aircraft within allied inventories will require replacement within five to fifteen years, due to airframe fatigue, provided the aircraft are not lost through combat attrition (as in the case of the Philippines). Although the OV-10 and the A-37 were retired from the US inventory in the mid-1990s[12], a large number of these aircraft are still flying with over 15 air forces worldwide. Furthermore, of some 108 Pucar‘as built for the Argentine Air Force, about 60 remain in service[13]. The world’s COIN fleet is largely based upon Vietnam era platforms. Furthermore, based upon lessons learned from Vietnam, most COIN aircraft in service today, including the A-37s, OV-10s and IA-58s, are generally ineffective. While the A-10 may satisfy USAF COIN needs, there is currently no satisfactory Super-COIN platform available for export customers at a flyaway cost of under $10 million. There are presently no new, dedicated COIN aircraft in production by any aircraft manufacturer, anywhere. Furthermore, STAVATTI is unaware of any all-new, dedicated COIN platform under development by any prime contractor to satisfy future COIN aircraft market requirements benefiting from the lessons learned in Vietnam.

Forty years after the conception of dedicated COIN platforms to fight limited wars under the Kennedy Administration, the aerospace defense industry should have a firm grasp of what is necessary to complete CAS missions successfully and defeat insurgent rebel groups. There were enormous lessons to be learned from the Vietnam War, one of them is the nature of COIN. First of all, there is no such thing as a Limited War. Wars must be fought to defeat threats entirely, using maximum available firepower, without political limitations. Otherwise the war will be lost, as in the case of both Korea and Vietnam. Secondly, what may appear to be a fringe organization of isolated rebels equipped with primitive weapons is often the leading edge of an extremely well backed, well trained, well equipped, regimented organization.

The vast majority of all insurgents worldwide are backed by governments of significant capability who encourage the actions of rebel front organizations. In the case of Vietnam, the North Vietnamese were backed by the PRC and the USSR. Likewise, 1980‘s era Latin American rebels were backed by the USSR and Marxist states including Cuba and Libya. Similarly, the rebels in the southern Philippines are directly related to the Mojahedin who are in fact integrated within greater Muslim/Arab world and backed by nations including Iran, Iraq, Malaysia, Syria and Saudi Arabia. As a matter of fact, Iraqi resistance fighters today are known throughout the nation as the Mojahedin.

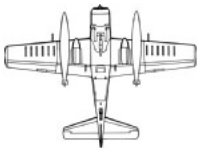
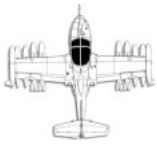
The vast majority of all insurgents are equipped with sophisticated weapons including FIM-92A Stinger or SA-7 Grail man-portable surface-to-air missiles[14]. In Vietnam, the insurgents were even equipped with SA-2s. While lacking the heavy hardware often associated with regular military forces, most rebel groups are capable of downing aircraft as well as releasing chemical and biological agents of war. Furthermore, the vast majority of all insurgents are ultimately the forerunners of a larger, regular military force which intends, upon conflict escalation, to engage in active combat, as in the case of the Vietnam War.

The 9/11 WTC attacks was an overt awaking to the fact that Wars of insurgency are upon us. They are called terrorists, anarchists, assassins, guerillas and revolutionaries. They belong to the Mojahedin, ELN, FARC, AUC, UNITA, IRA, GIA, PLO, PKK, FMLN, ASD, Al-Qa‘ida, Al-`Asifa, AMAL, Dark Harvest, Orange Volunteers, FPMR, ESSA, KNU, Nucleus Faction, Mong Tai Army, RENAMO, GSPC, and over 400 other liberation fronts, terrorist organizations, narcotics/substance cartels and para-state entities worldwide. Their ranks have besieged society for centuries. Their acts lit the fuse which detonated the Spanish American War, World War I, the Arab-Israeli War and the ongoing War on Terror.

The principal military threats facing the 21st century will not be nuclear exchanges between super powers or conventional armed conflicts engaging nation-states, but instead acts of terrorism perpetrated by insurgent forces engaging in guerilla, civil and urban warfare. Today nations including Colombia, Japan, Pakistan, the Philippines, Chile, France, Bolivia, Ireland, Egypt, Greece, Turkey and many others are plagued by five or more resident terrorist organizations. These organizations are not waning in membership, but instead seriously forewarn of a coming anarchy. Properly executed, air power will effectively dispatch insurgent rebel forces. The SM-27 MACHETE™ is the Proper Executioner.

Analyzing the nature of COIN, it is apparent that the most successful COIN type platforms are those which can not only successfully engage rebel guerilla groups, but continue to successfully engage the regular military troops who follow in the place of guerilla insurgents upon conflict escalation. The OV-10, IA-58 and T-28D are not successful COIN platforms as they lack the capability to engage both guerilla and regular military forces alike. Conversely the A-37 Dragonfly was developed specifically as a result of experiences in the Vietnam War and hence was a far more capable COIN platform. The A-37 did not have the range or endurance, however, to complete COIN missions effectively. The best COIN platform of the Vietnam was, as previously discussed, the A-1 Skyraider, which although slow, had the range, endurance, survivability, maneuverability and external stores capacity to carry out the mission. Reviewing the performance and capabilities of these five aircraft as provided in TABLE 1.0 may provide some insight into what makes a truly effective COIN platform:

TABLE 1.0: HISTORICAL COIN AIRCRAFT EFFECTIVENESS FACTORS

AIRCRAFT	DOUGLAS A-1E SKYRAIDER	NORTH AMERICAN T-28D NOMAD	CESSNA A-37B DRAGONFLY	ROCKWELL OV-10A BRONCO	FMA IA-58 PUCAR'A
					
Effectiveness As COIN	Highly Effective	Not Effective	Effective	Not Effective	Not Effective
Year Introduced	1947	1949	1967	1967	1969
Accommodation	1	2	2	2/5	2
Horsepower/Thrust	3,050 HP	1,425 HP	5,700 Lbs	1,430 HP	1,956 HP
Gross Weight (lbs)	25,000	15,600	14,000	14,444	14,990
External Warload (lbs)	8,000	1,800	4,100	3,600	3,370
External Hardpoints	15	6	8	7	3
Wing Loading (lbs/sq ft)	62.5	57.3	65.4	49.6	45.9
Power Loading	8.1 lbs/HP	10.9 lbs/HP	2.1 lbs/lb st	10.1 lbs/HP	7.66 lbs/HP
Max Level Speed (kts)	297	312	440	244	270
Max Climb Rate (Ft/min)	2,300	5,130	6,990	2,650	3,545
Max Range (nm)	1,300	2,760	878	1,240	2,002

Upon reviewing the aircraft data provided in TABLE 1.0, it becomes apparent that the most effective COIN platforms, Douglas A-1 Skyraider and the Cessna A-37 Dragonfly, had some striking similarities which are lacking in the T-28D, IA-58 and OV-10D. Firstoff, it is apparent that an effective COIN platform must be capable of carrying an external stores load of at least 4,000 lbs. Secondly, most effective COIN platforms have a high maximum level speed of nearly 300 Kts. Typically effective COIN platforms have a low power loading and a wing loading greater than 60 lbs/sq ft. The low power loading is necessary for responsiveness and a high rate of climb, while the high wing loading decreases the aircraft's susceptibility to turbulence. While COIN platforms typically appear to have a crew of two, the ever-successful A-1 Skyraider only had a crew of one. It must be recalled that the reason most COIN platforms have a crew of two is not due to the complexities of flying a COIN mission, but due to the fact that in the case of Vietnam, a South Vietnamese observer/crewmember had to be present to authorize the use of firepower until 1965. Reviewing TABLE 1.0, it is clear that all COIN platforms offer maximum gross weights of at least 14,000 lbs, at least 6 or more external stores hardpoints and a range of 800 nm. Finally, of the five COIN platforms reviewed, two were single engine piston (Skyraider and Nomad), two were twin engine turboprop (Pucar'a and Bronco) and one was a twin engine turbojet (Dragonfly).

Reviewing the critical characteristics which entail an effective COIN platform as presented in TABLE 1.0, as well as considering the significantly improved capabilities and lethality of modern rebel insurgents, STAVATTI developed a series of general performance and design requirements which the MACHETE must adhere to in order to result in an extremely effective COIN system. These requirements are largely similar to the A-X requirements as originally specified in 1966, with exception of the external load and anti-tank requirement. STAVATTI strongly believes that a highly effective COIN platform should be economical to procure (on the order of $5 to $8 million). Although the USAF found that the destruction of tanks was a foremost requirement for a Super-COIN platform, STAVATTI does not believe that most

COIN platforms engage multiple tanks while countering insurgents. Rather, the MACHETE requirement is to destroy one tank per flight. As a single tank can be destroyed using a single 2,000 lb Laser Guided Bomb (LGB), STAVATTI has specified that the MACHETE need only carry two, 2,000 lb LGBs (one to dispatch a tank and one for back-up in the event the first LGB is off-target). In so doing, the SM-27 MACHETE load capacity is driven by the need to carry two, 2,000 lb LGBs or precision GPS guided GBU-31/GBU-32 JDAMs in conjunction with AAMs (such as the AIM-9) for self-protection. In so doing, the total weight of the SM-27 MACHETE aircraft can be kept to a minimum (as compared to the A-10), hence reducing overall complexity and ultimately, flyaway cost. Due to the use of a MIL-STD-1760 weapon interface bus and six wing hardpoints, the SM-27 is also able to carry up to six AGM-65 Maverick missiles, enabling additional anti-tank capability without sacrificing performance.

The general design requirements were compiled during the “Requirements and Specifications Generation” phase of the MACHETE development program during August 2000 follow in TABLE 2.0:

TABLE 2.0: SM-27 MACHETE™ COIN GENERAL DESIGN REQUIREMENTS

Aircrew:	≥1
Vmax @ Altitude:	≥400 kts
Vmax @ SL:	≥300 kts
Minimum Approach Speed:	≤80 kt
Maximum Climb Rate:	≥5,000 ft/min
Economical Cruise Range:	≥1,000 nm
Maximum Ceiling:	≥35,000 ft
Buffet-Free Sustained Load Factor:	≥+7.5g/-3
Structural Load Factor:	≥+9g/-4
Maximum Gross Weight:	≥12,500 lbs
Maximum External load:	≥5,000 lbs
Number of External Hardpoints:	≥5
Internal Armament:	(1) 30mm Cannon
Wing Loading at Maximum Gross Weight:	≤75 lbs/sq ft
Power Loading at Maximum Gross Weight:	≤5 lbs/hp
Maximum Performance Take-off Length:	≤1,200 ft
Size and Footprint Restrictions:	Comparable to OV-10
Maximum Vertical Descent Rate:	≥15 ft/s
Unit Flyaway Price ($ 2000):	≤$6,000,000

In the course of satisfying MACHETE design requirements, uncommon emphasis is to be placed upon increasing aircraft survivability against high caliber cannon and surface-to-air missiles, insuring a low aircraft powerloading, increasing aircraft range, endurance and on-station loiter time and ensuring that the MACHETE is affordable. Currently, most advanced trainer-type aircraft cost on the order of $5 million to $10 million. STAVATTI must ensure that the SM-27 MACHETE platform has a unit flyaway cost on the order of $6 million to $10 million to remain competitive, despite its superior sophistication and capabilities. Due to enormous defense spending cutbacks world-wide, air forces have significantly reduced financial reserves for new weapon system procurement. Due to threats posed by rebel groups throughout the developing world, future military forces not only need to maintain the same level of strength they have today, but increase their capabilities, thus thwarting potential acts of aggression. To allow air arms to procure the number of aircraft they need, while yet attaining a significant increase over the performance and capability of previous combat systems, the unit flyaway and total lifetime cost of a next generation aircraft must remain relatively similar, or at least provide greater value while maintaining competitive pricing. Accommodating most budgets, the modest pricing of the SM-27 MACHETE allows nations such as Thailand to purchase an adequate quantity of COIN aircraft while significantly increasing their capability.

In December 2001 it was determined that the SM-27 MACHETE could be significantly enhanced and reach a broader market if a two-place tandem variant of the MACHETE was developed. This two place aircraft would not only satisfy the COIN role, but would also serve as an Advanced Trainer (AT). From December 2001 through April 2002, STAVATTI undertook a complete review and redesign of the SM-27 MACHETE to permit the aircraft to incorporate two unreclined Martin Baker MKUS.16L ejection seats in tandem, while featuring dual controls and instrumentation. The result was the creation of a slightly larger aircraft with significantly increased cabin volume, avionics bay volume and greater internal fuel capacity. In May 2002 this new MACHETE configuration became the new standard in STAVATTI COIN/Advanced Trainer aircraft. Today the MACHETE consists of two variants: the single seat SM-27S COIN platform and two-place tandem SM-27T COIN/Advanced Trainer.

In so doing, while the SM-27S competes directly with current production COIN platforms such as the Embraer AT-29 ALX, the SM-27T competes with far more prevalent and occasionally more lucrative advanced trainers. Competition for the SM-27T consists of the Embraer EMB-314 Super Tucano, Pilatus PC-9/PC-21 and Raytheon T-6A Texan II. Sold at a slightly higher price point of $6.5 to $9.5 million, the SM-27T potentially doubles the MACHETE‘s global sales prospects.

VI. MACHETE MARKET & MARKETING

Scheduled to enter Low Rate Initial Production in 2007/2008, the MACHETE will be marketed primarily via Direct Commercial Sales (DCS) to the US DoD as well as the air arms of NATO, ASEAN and CENTO11 member nations which require COIN aircraft to counter current and/or anticipated insurgent rebels. Produced at an anticipated rate of 50 aircraft annually (including 33 SM-27S and 10 SM-27T) at an average estimated per unit flyaway cost of approximately $8.4 million, STAVATTI anticipates a market

[redacted]

A successor to the OV-10 Bronco and A-37 Dragonfly, of the over 271 OV-10s and 550 A-37s produced, 90 Broncos and 140 Dragonflies are still in-service today and will require replacement within the next 15 years. Also a successor to the OA-10A, there are approximately 116 FAC Thunderbolt IIs in USAF service which will eventually require replacement as unit age reaches beyond 22 years. The MACHETE is developed to satisfy these specific needs, addressing a projected requirement for over 820 new dedicated COIN and 1,300 new Advanced Trainer Aircraft worldwide over the next four decades. A market valued at over $12 billion, STAVATTI

[redacted]

Potential domestic customers include the original operators of the A-37 and OV-10: the USAF and the USMC. The SM-27 has the potential to serve the US DoD as an effective special operations command and regular USMC/USAF COIN/CAS/FAC platform. Specifically, the USMC began operating the OV-10 in 1968. The last USMC OV-10D squadron, operated by VMO-4, was retired on 16 April 1994. There has

been no subsequent successor to the USMC OV-10 retirement. Similarly, the USAF is currently operating a variant of the A-10 Thunderbolt II, designated OA-10A, in the FAC role. STAVATTI believes the SM-27S is the most effective and efficient successor to the aging A-10 platform in this role. Primarily focused upon COIN sales, prospective customers and their anticipated associated market requirement and market value are as provided in TABLEs 3.0 and 4.0.

TABLE 3.0: SM-27 MACHETE™
PROJECTED SM-27S MACHETE COIN MARKETS

[redacted]

*Projections based upon an SM-27S Unit Flyaway Cost of $8.2 Million

TABLE 4.0: SM-27 MACHETE™
PROJECTED SM-27T MACHETE ADVANCED TRAINER MARKETS

[redacted]

*Projections based upon an SM-27T Unit Flyaway Cost of $8.6 Million

[redacted]

allied sales. Sales to these nations will likely be conducted via DCS, however, STAVATTI welcomes the possibility of working with both the Defense Security Cooperation Agency (DSCA) and appropriate service branches to market and support the sale of the MACHETE to allies via FMS. In addition to an estimated

[redacted]

MACHETE FOR DoD

There is significant potential for DoD to benefit from the MACHETE program. The MACHETE represents a new weapon system with new capabilities to satisfy a requirement not presently being satisfied by manned or unmanned platforms. While the COIN/FAC mission was once the role of A-1s, T-28Ds, A-26s, OV-10s and A-37s, none of those aircraft are presently in DoD inventory. The last OV-10 unit, USMC VMO-4, was deactivated on 16 April 1994, essentially ending the service presence of a dedicated COIN/FAC aircraft. While the COIN/FAC role has been reassigned to the OA-10A derivative of the A-10 Thunderbolt II, STAVATTI believes this application of the A-10, itself an average of 22 years old, is not the most efficient and effective use of air power or force structure, paving way for the need for a newer platform with similar speed, range, maneuverability and endurance, but lower operational costs, reduced maintenance requirements and higher operational availability and sortie rate.

Upon conducting a thorough review of COIN/CAS it becomes apparent that this period in history since 1994 is one of the first times in nearly 50 years that US service branches have not had a dedicated COIN/FAC/light CAS aircraft. Although the Korean War served as the “Dawn of Jet Combat” introduced by F-86, F-84, F-80 and F-9F fighters, successful satisfaction of the CAS/FAC mission yet rested with piston driven F-51s, F4Us and A-26s to dispatch North Korean ground forces. During the Vietnam War, the principal COIN/CAS aircraft under the 1961 MAP Farm Gate program was the T-28D and the A-26. T-28 losses spurred the initiation of the 1964 LARA program, ultimately resulting in the OV-10. As an immediate solution to COIN was required prior to the fielding of LARA, over 1,000 USAF and USN A-1 Skyraiders were assigned to Vietnam, serving as a principal COIN/CAS platform through 1973. From 1967 through 1994, the principal aircraft to satisfy the DoD COIN/FAC role were the A-37 and the OV-10.

Although the A-10 was developed from the A-X program which originally focused upon the creation of a Super-COIN, the A-10 program became focused upon the anti-tank role, rather than a solution to CAS problems faced during Vietnam. Known for its unparalleled anti-tank capability, the A-10’s mission has principally focused upon an anti-armor role, originally in Eastern Europe and today in the Middle East. While capable of performing COIN, the A-10 has never been exported to allies to satisfy COIN requirements, nor is available for such sale. In general, the original SUPER-COIN requirement of the 1967 RFP was never satisfied. The COIN lessons learned from Vietnam were never properly addressed. The MACHETE has been designed to satisfy this original 1967 A-X SUPER-COIN need that exists to this day.

Concluding the review of history, let us look at the numbers: The Douglas A-1 Skyraider was produced between 1945 and 1967 with over 3,180 built. By 1962 this aircraft originally designed in WWII was fast becoming the most important aircraft of the Vietnam War. Over 1,000 A-1s were used in Vietnam by both the NAVY (on carriers), USMC and USAF. The North American/Rockwell OV-10 Bronco was produced from 1968 and while considered unsuitable for COIN due to speed and armor, 271 of these aircraft were procured for use by the USAF and USMC alike. The Cessna A-37 Dragonfly was produced from 1966 until 1976 with a total of 550 built. The A-10 Thunderbolt II was produced from 1975 through 1974 with over 713 delivered. Of these five COIN/CAS/FAC platforms, only one is still in DoD service: the A-10 with 362 in inventory, 116 in the OA-10A FAC role operated by the USAF/AFRES and ANG.

Based upon this historical precedent, in our age of counter-insurgency STAVATTI believes the MACHETE could serve as a highly effective COIN platform in both USN, USAF and USMC inventories as a successor to A-1s, OV-10s and A-37s. A highly maneuverable aircraft with significant warload, the MACHETE’s

short field ability at MTOW make it suitable for carrier and forward airstrip operations alike. Available in single seat and two seat tandem variants, the MACHETE has the potential to be serve as both a COIN/Attack and FAC/Advanced Trainer platform. An advanced design incorporating fully integrated avionics, the MACHETE is readily convertible to an unmanned/autonomous UAV configuration as well.

Regarding FMS, it is known that both the A-37 and OV-10 have been sold by the USAF/USN by allied customers. Colombia, for instance, is an operator of both the A-37 and OV-10 with a current fleet of 26 and 15 aircraft respectively. The first 10 FAC A-37s were delivered in 1980 from surplus USAF stocks while the US provided further A-37s in 1989. Regarding the OV-10s, 11 former USAF aircraft were delivered in 1991 with more provided from USMC stocks in 1993. STAVATTI envisions a similar situation whereby the MACHETE could serve as the dedicated COIN platform “of choice” being exported either as new or as surplus stock from USAF/USMC or USN inventory. Similarly, the RAYTHEON AT-6 could be marketed as the attack derivative of a dedicated USAF/USN trainer. Employing this structure, the MACHETE would be akin to the OV-10 and the AT-6 would be akin to the A-37 derivative of the T-37 which the T-6A is gradually replacing. In so doing, both STAVATTI and RAYTHEON could benefit from a COIN focused, DoD FMS program.

Ultimately, a model similar to that implemented in the F-5 program could be followed to foster an FMS relationship between the USN/USAF/USMC and STAVATTI. Northrop developed the F-5, then known as the N-156F, beginning in 1955 with prototype roll-out in 1959 as a private, corporately sponsored initiative. In 1962 the USAF selected the N-156F, then re-designated the F-5, to meet the FX requirement under the Mutual Assistance Program (MAP). While the F-5 never saw significant service within the USAF inventory (aside from 112 used in Aggressor squadrons), both the USAF and Northrop benefited from a mutual MAP/FMS relationship which resulted in the successful sale/foreign licensed production of over 2,600 F-5s worldwide.

STAVATTI has focused primarily upon the Direct Commercial Sale (DCS) of the MACHETE. While we have discussed our program with a variety of U.S. Service Branch chiefs including Admiral Joe Dyer (Ret.) of NAVAIR, this project has had no service arm sponsorship to this date. The MACHETE project

[redacted]

SELLING THE MACHETE

STAVATTI employs a standard methodology to market military aircraft products to all potential NATO/Allied foreign military customers. That methodology will be applied in marketing the MACHETE abroad and is described herein.

Prior to initiating any new aircraft development program, STAVATTI conducts an initial market survey to determine what specific aerospace needs must be satisfied, either immediately or within the near-term, by a prospective aerospace vehicle or system development program. This market survey includes a study of existing, in-service types which address a specific mission/role and an assessment of the age and anticipated retirement date of these existing types based upon fatigue life and accumulated cycle time. The market survey also includes a substantial customer survey element whereby potential end-users are either directly contacted or interviewed, and documents discussing specific customers needs (such as White Papers and Request For Proposals) as issued by potential customers are obtained reviewed by STAVATTI. In the event a completely new and original aerospace need must be addressed (as in the case of a UAV), the direct customer survey element takes precedence over the study of existing types, which is not possible. The direct customer survey interview consists of both formal, on-duty and in-formal, off-duty discussions with senior air staff, acquisitions and logistics personnel of flag, command and to a degree, enlisted rank. Discussions with actual operators, including pilots, RIOs and WSOs and warplanners alike are of critical importance at this juncture. The results of these surveys, observations and discussions are employed to forge internal STAVATTI create a requirements and specifications matrix, which in-turn drives the impetus behind subsequent conceptual and advanced design efforts.

STAVATTI initiated SM-27 MACHETE concept development only after conclusion of discussions with the senior air staff personnel of a potential Pacific Rim customer which indicated an anticipated need for an OV-10 replacement. These discussions coupled with a thorough analysis of the OV-10 and its role in close air support resulted in the generation of initial requirements and specifications for the MACHETE, as noted in TABLE 2.0. Upon initiation of concept development, STAVATTI began an initial market study which included the contacting of additional perceived potential end-users, employing preliminary MACHETE concept material as “talking-points” with which to further ascertain real customer interest. Once such customer interest was validated to the degree necessary to assure that STAVATTI would likely exceed the break-even point on MACHETE sales (provided the aircraft was developed at a specific cost and sold at a specific price point), STAVATTI proceeded beyond the conceptual design stage.

As illustrated, the marketing of a STAVATTI product often begins long before conceptual design. In essence, the STAVATTI process centers upon identifying an anticipated future need, confirming this anticipated need through market study, survey and initial discussions with end users, development of a concept and presentation of this concept to potential customers. Provided customers indicate an interest in the conceptual design element, STAVATTI then moves the program beyond conceptual design into advanced and later detail design. Throughout advanced and detail design, a “business case” for the new vehicle/system is developed, including a thorough identification of potential customers and their anticipated needs. Once these steps have been completed, an aircraft “concept” is reviewed by both STAVATTI executive officers and the Board Of Directors. Provided the “concept” offers a sound technical and business case, executive management will move to formally endorse the “concept” as an official “STAVATTI PROGRAM” thereby authorizing further development from the concept stage into a demonstratable, and later, producable article.

Once a new aerospace vehicle/weapon system moves from concept into advanced design, STAVATTI applies for Prior Approval To Market the specific new product to anticipated NATO/Allied customers through the US State Department-Directorate of Defense Trade Controls (DDTC). This process requires STAVATTI to submit both a letter of request and relevant technical data to DDTC in Washington, D.C. Receipt of prior approval to market may require 45 days to 16 months, depending upon the specific system and the intended potential customer.

Upon receiving prior approval to market, STAVATTI begins formal marketing to potential customer nations. STAVATTI markets aircraft using a combination of aggressive lobbying techniques and passive marketing (including aerospace periodical advertising, trade show attendance, etc.). Both marketing approaches

employ the use of marketing directors, agents and sales persons from STAVATTI headquarters, as well as from resident sales offices within the potential customer nation or geographic region. In the case of both Colombia and the Philippines, STAVATTI established resident marketing agents within the said nations prior to initiating formal marketing initiatives. Marketing also includes constant liaison with the nation through their US based Embassy and relevant Air Defense/Procurement Attache. Establishing first contact with the Embassy Defense Attache will begin a very positive, business relationship which will often lead to a direct forwarding of MACHETE marketing materials to the relevant procurement body within the said nation. The next step is to contact the air defense forces of the nation and discuss their procurement needs, tailoring the configuration of the MACHETE to cater to their wants and desires. This may lead to distinct meetings with air force and political leaders.

Resident and non-resident sales and marketing agents are then responsible for contacting and meeting with senior air staff and procurement officials within potential customer nations. Prior to receiving DDTC marketing approval, STAVATTI marketing agents begin discussions using only public-domain product marketing literature, such as that posted on the STAVATTI website. Discussions are limited to product overviews only and do not include presentations, or proposals. Upon receiving DDTC approval to market the MACHETE to a specific Government, STAVATTI will provide potential customer representatives, including key air staff members and government officials with export controlled technical data, as well as numerous multi-media and live, in-person presentations. Highly detailed desktop scale models of STAVATTI aircraft will likewise be presented as “loans” or “gifts.” At this point, potential customers will be invited to tour STAVATTI facilities and provided the SM-27 MACHETE is prototyped, examine the prototype. In the event the prototype has either 1) cleared its flight test envelope or 2) entered LRIP, customers will be invited to have qualified air staff members as well as test/evaluation pilots present at STAVATTI flight test sites within the US for a first-hand look at the aircraft in-action. Following pre-clearance on ground-based MACHETE Full-Mission Simulators, test/evaluation pilots of the potential customer nation will be permitted to fly MACHETE aircraft as an element of their evaluation of the system. Such flight evaluations will likely include full-envelope evaluation and ordinance demonstrations and permit up to 25 hours of initial flight time at STAVATTI marketing budget expense. This first-hand “kick-the-tires” event is crucial in securing firm aircraft orders from foreign customers.

Following presentations, in the event the potential customer has issued either a Request For Information (RFI) or Request For Proposal (RFP), STAVATTI will respond to the RFP or RFI. In the even the customer has not issued an RFI or RFP, STAVATTI will likely submit a “Draft Procurement Proposal” or “Draft Unsolicited Proposal” to the customer for their review and comment. Provided either draft proposals result in positive interest on the customers part, STAVATTI will request that a “Letter of Interest (LOI)” or “Letter of Import Authorization” for a non-binding, hypothetical number of systems and related support equipment is issued. This LOI will then serve as an instrument with which STAVATTI will apply for a DSP-5 Permanent Export License from DDTC. for the intended customer nation. Receipt of the DSP-5 is critical, as it will determine if STAVATTI is permitted to export the aircraft to the intended customer. DDTC processing times for DSP-5 license applications require anywhere from 45 days to 16 months.

Upon receipt of an approved DSP-5 export license, STAVATTI will intensify MACHETE marketing efforts. At this stage, however, it is most probable that the customer is already committed to procurement of the aircraft. In any event, it as at this time that STAVATTI will likely initiate a “marketing tour” permitting the potential customer air arm personnel to conduct and evaluation of demonstrator aircraft within their nation to ensure integratability and inter-operability, including a full flight test and demonstration upon completion of MACHETE development and flight test. Customers interested in participating in the MACHETE program during development will be permitted to participate to a limited degree during the flight test program. Upon conclusion of general marketing and recognizing how STAVATTI can best address customer needs, it is anticipated that a formal Procurement Proposal will be issued to the potential customer nation, either in response to an RFP, or unsolicited based upon perceived interest.

Once a nation indicates interest in forwarding a production contract for a specified number of MACHETE, STAVATTI must receive a Letter of Commitment and/or the Production Contract from the said nation. All SM-27 MACHETE Production Contracts will contain a said number of production MACHETE aircraft as well as weapon system operation and service instruction and training equipment, contractor technical and logistics personnel services, associated support equipment, flight test instrumentation, software development-integration, spares and repair parts, publications and technical documentation, and other related

requirements to ensure complete program supportability.

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accept payment by wire transfer of funds or certified check, with payment terms of 50% upon program initiation and 50% upon program completion. All funds must be in US Dollars (USD), gold equivalent or alternate offset as negotiated (coal, oil, etc.). Customers can expect delivery of initial aircraft at a rate of one to five per thirty days with a maximum production rate of 50 units annually during peace-time conditions. Although it is possible that MACHETE aircraft as ordered may be purchased out-right with cash-on-hand, it is more likely that customers will elect to finance the acquisition. To assist customers in the procurement of aircraft, STAVATTI will offer all customers with integral financing packages to address DCS and FMS costs alike. Such financing packages will be provided by external commercial banking entities, such as a particular export finance entity which is the STAVATTI Financier-Of-Choice for STAVATTI's SM-27 MACHETE proposal to the Colombian Air Force in support of their possible procurement of 24 aircraft.

All MACHETE aircraft as delivered will be accompanied by a 1,000 hour or extended, cost optional 3,000 hour "Nose-to-Nozzle" Manufacturers Limited Warranty on all material and workmanship, as dependent upon customer desires. To date, the unit flyaway price of the MACHETE configuration offered to the Colombia is approximately $8.2 million for the SM-27S and $8.4 million for the SM-27T.

MASS MARKETING

Organized to exceed the taste, flavor and effectiveness of marketing campaigns of leading competitors, the MACHETE marketing campaign will focus upon a proactive, "Mass Marketing" approach immediately following aircraft certification/qualification. This mass marketing approach is the principal element in STAVATTI passive marketing. First, STAVATTI will ensure that marketing approval for the weapon system and specific MACHETE configurations with the United States Department of State-Office of Defense Trade Controls is secured for all appropriate allied nations. STAVATTI is has already received prior approval to market the MACHETE to the Philippines and all NATO nations. STAVATTI will NOT MARKET the MACHETE to the following threat nations:

Angola, Armenia, Azerbajian, Belarus, Cuba, Iran, Libya, Mongolia, North Korea, Syria, Tarjirkistan, The People's Republic of China, Federal Republic of Yugoslavia, Haiti, Liberia, Rwanda, Somalia, Sudan and Zaire

Once marketing approval is received, STAVATTI will begin a mass marketing campaign focused upon allied nations. Employing information approved by the State Department-Office of Defense Trade Controls for release to the public domain, STAVATTI will introduce the SM-27 MACHETE to the aerospace defense community. This introduction will be achieved initially by attendance and exposition of STAVATTI and its wares in model, prototype and production form at global defense expositions in addition to directed proactive marketing efforts. To market the MACHETE abroad, once in production STAVATTI will establish as presence at numerous major defense expositions including Farnborough in England (Biannually in September) and The Paris Airshow in France (Biannually in June). To accomplish such, STAVATTI

[redacted]

motional articles, STAVATTI must maintain a presence on the order-of and superior-to Lockheed Martin, Boeing, etc. In addition to the indoor pavilion booth, STAVATTI must maintain on-ramp static displays of both full-scale mock-ups and as available, prototype and production aircraft. Coupled with the static display, once the MACHETE prototype rolls-out, a demonstration flight must be conducted at least once per day at the airshow. Each demonstration flight will be performed by an aircraft other than that on static display and must exceed the demonstration of leading competitors including Lockheed Martin, and of course, the Russians. In general, after take-off the MACHETE must perform multiple snap rolls which will lead to choreographed competition aerobatics and the demonstration of viable low-level combat maneuvers. The purpose of the flight demonstration is to illustrate the clear superiority of the MACHETE aircraft. Serving as a critical component of the fighter marketing campaign, the Farnborough and Paris Airshow Exhibitions allow STAVATTI to demonstrate the MACHETE on a direct, quasi-proactive basis.

In addition to Farnborough and the Paris Airshow, STAVATTI intends to attend at least five additional

aerospace defense expositions every year. Ranging from Dubai in the UAE and Air India in India to the Dayton International Airshow in Ohio, the shows must occur in friendly, allied or NATO nations and will also consist of indoor pavilion, on-ramp static and in-flight demonstration expositions. Airshows and Defense Expositions occur but a few times per year, however. The purpose of the STAVATTI marketing campaign is to demonstrate to potential customers not only that the MACHETE is a viable product for their long-term defense needs, but that STAVATTI is a long term, established defense prime contractor.

[redacted]

is clear that STAVATTI must follow suit. STAVATTI must maintain full color, full page or dual page ads for the SM-27 MACHETE and STAVATTI in publications including Air Force Magazine, Aviation Week & Space Technology (AW&ST), Jane's Defense Weekly, etc. These basic ads, circulated world-wide, will establish a constant presence if STAVATTI runs ads on a monthly or weekly basis as applicable. STAVATTI must maintain an advertisement within relevant journals and reference publications including the World Aviation Directory and Jane's All The Worlds Aircraft.

To secure significant sales, STAVATTI's marketing campaign must establish extremely positive relations with militaries and purchasing bodies. Focusing primarily upon DCS, the MACHETE will be sold as a customized product for distinct customer needs, rather than serve as a tool for foreign policy as in the case of the FMS Program. STAVATTI must directly pursue customers through direct contact. STAVATTI must employ full-time active lobbyists at home and abroad. Consisting of trained industry professionals ranging

[redacted]

Throughout the marketing process, STAVATTI will focus upon the performance and capabilities of the aircraft, and that of the corporation for securing contracts. It is the general STAVATTI philosophy that by offering a superior aircraft at a reasonable price, the product will in-fact sell itself and the sales-staff should politely "move out of the way" and let the customer procure their new "object of desire" with haste commensurate to the degree of their want.

[redacted]

that Boeing Leaders Phillip M. Condit, Chairman & CEO and Michael M. Sears, Senior VP and CFO were forced to resign due to allegations of bribery and illicit contract structuring with regard to Boeing's attempt to market/sell/lease 767 aircraft to the USAF as tankers for in-flight refueling. As it presently stands, both Sears and Darleen A Druyun of the USAF are facing prison time for their part in the Boeing's illegal 767 tanker marketing methods. Ironically Drunyun and Sears were both recipients of the prestigious AIAA Hap Arnold Award for Excellence in Aeronautical Program Management Awards in 1997 and 1998 respectively. As STAVATTI Chairman Beskar has met with Sears while Boeing CFO in the company of Wendell Maddox and has been the chairman of the Hap Arnold Award selection subcommittee since 2003, the reality of this scandal is well noted. As such, STAVATTI is absolutely committed to taking the high ground and remain committed to morally ethical, DCS or FMS.

STAVATTI is, however, open to conducting STAVATTI aircraft sales via FMS provided customers desire to procure the aircraft through FMS. As a privately developed product, the MACHETE is not required to be sold through FMS, but it is an option which a variety of service branches, including the USAF, are open to facilitating. Likewise, the structure offered by STAVATTI HEAVY INDUSTRIES provides STAVATTI to address customer offset and joint-production desires with greater effectiveness than most competitors.

VII. MACHETE COMPETITION

Competition for the SM-27 MACHETE consists of four aircraft types: 1) Dedicated COIN Platforms 2) Advanced Trainers capable of satisfying the COIN role 3) Lead-In Trainers/Light Attack Aircraft 4) Close Air Support (CAS) Platforms.

The primary competition for the SM-27S consists of Dedicated COIN Platforms. These aircraft, consisting of the Cessna A-37B Dragonfly, Lockheed Argentina (formerly FMA) IA-58 Pucar‘a and Boeing (formerly Rockwell) OV-10D Bronco, were designed specifically for the COIN role. Developed during the 1960s, all three of these aircraft are no longer in production. While a number of these aircraft are still in-service with air arms, they are reaching retirement age. The MACHETE is being designed specifically to replace these aircraft. The MACHETE will not likely compete directly against any of these aircraft, although used models of these platforms may be sold to potential MACHETE customers at a significantly lower cost than a new MACHETE.

It is important to recognize these platforms as primary competitors, however, as STAVATTI must convince air forces that the procurement of new MACHETEs to satisfy COIN requirements is more favorable than upgrading any of these three platforms such that they remain in active service for decades to come. The SM-27S MACHETE must offer superior capability over all three of these aircraft in terms of performance, operating cost and maintainability in order to convince customers to replace their aging COIN fleets with all new MACHETEs. As these platforms were procured a number of years ago, STAVATTI is unaware of the average unit flyaway cost of this platform type[12]. Aside from the SM-27S MACHETE and Embraer ALX (initiated in 1995), STAVATTI is unaware of any all-new, dedicated COIN platform currently in production or under development.

The principal competition for the SM-27T MACHETE (and notably the most harsh), consists of Type 2 competitors-Advanced Trainers capable of satisfying the COIN role or developed into derivative COIN variants. These aircraft, consisting of the Aermacchi SF. 260TP, Beech T-34C Turbo Mentor, Embraer EMB-314 Super Tucano/AT-29 ALX, Pilatus PC-7, Pilatus PC-9, Pilatus PC-21, Raytheon T-6A Texan II, Raytheon AT-6B Ranger, KAI KT-1, KAI KO-1 and SOCATA Group TB-30 Epsilon are primary trainers which can satisfy COIN missions to a limited degree. All of these aircraft are currently in production, with exception of the Beech T-34C which is still in the active inventory of many air forces worldwide. All of these aircraft are two place, single engine aircraft which range in price from $400,000 (in the case of the SF. 260TP) to over $6 million (in the case of the Raytheon T-6A Texan II).

Although none of these aircraft were designed as COIN platforms from the onset, the manufacturers of these products market them as Trainers capable of satisfying the COIN/Light Attack mission as a secondary capability. Literally hundreds of each one of these aircraft have been produced and these platforms compose the backbone of most air force flight instruction programs. Although all of these aircraft are capable of satisfying a COIN requirement, STAVATTI's stiffest competition will likely come from the Embraer EMB-314 Super Tucano/AT-29 ALX the Raytheon T-6 Texan II/ and the Pilatus PC-9/PC-21[13]. The KAI KO-1 introduced in 2003 is also a strong competitor.

The third type of aircraft which may pose competition for the MACHETE consists of Advanced Lead-In Trainers/Light Attack Aircraft. These aircraft include the high speed, turbojet/turbofan powered advanced trainers which are used to instruct future air force fast jet pilots. Including the Aermacchi S. 211, Aero L159 ALCA, Avioane IAR-109 Swift, British Aerospace Hawk/Hawk 200, Dassault/Donier Alpha Jet, Kawasaki T-4, Lockheed Argentina IA-63 Pampa, MAPO MiG-AT, Nanchang K-8 Karakorum, PZL I-22 Iryda, Samsung-Lockheed KTX-2, and Yakolev/Aermachi Yak-130, all of these aircraft are high performance, subsonic jet trainers which carry suitable external stores to satisfy both COIN and light attack missions. Air forces may purchase these aircraft to satisfy both the advanced Lead-In training and COIN/CAS role.

Unlike dedicated COIN and primary trainers capable of satisfying COIN missions, however, the expense of procuring and operating these aircraft, as well as their generally poor low speed, low altitude performance makes these aircraft unsuitable for most COIN missions. STAVATTI does not anticipate direct competition with any of these platforms in marketing the SM-27T MACHETE abroad, however, as these products are actively marketed for their light attack ability STAVATTI must consider them as potential, albeit unlikely, competitors. The average unit flyaway cost of these aircraft is approximately $10 million to $20 million. STAVATTI HEAVY INDUSTRIES is developing the SM-47 SUPER MACHETE to directly address these competitors, however details of that platform are beyond the scope of this program paper.

The final aircraft type which may serve as a competitor to the SM-27S MACHETE consists of the Type 4 competitors-Close Air Support (CAS) Platforms. These aircraft, including the Northrop Grumman (formerly Fairchild) A-10 Thunderbolt II and the Sukhoi Su-25 Rook/Frogfoot are extremely lethal, low speed attack platforms designed specifically for Close Air Support, Anti-Tank, Battlefield Suppression and COIN missions. The US developed the A-10 under the A-X program of 1966-1972. Created based upon experience gained in the Vietnam War, the mission of the A-10 is largely similar to that of the SM-27S MACHETE, with the exception that the A-10 was also designed to counter the threats posed by Soviet tanks in eastern Europe. The A-10, although very successful in Desert Storm, is no longer in production. Currently being replaced by F-16s, a number of A-10s have been designated as OA-10s and are used in the FAC role. The Sukhoi Su-25 was developed under a similar Soviet requirement as the AX and is often considered a direct copy of the Northrop A-9 (the A-10's fly-off competitor). Such allegations are unfounded, however, the two aircraft do have a remarkably similar configuration.

The Su-25 saw significant use in Afghanistan against the Mojahedin and remains in production. Although much larger aircraft than the MACHETE, these platforms are extremely effective in quelling rebel uprisings, although their complexity and cost prohibits their procurement by most developing nations. STAVATTI does not anticipate direct competition from either of these platforms due to their cost and complexity (the A-10 is also out of production). However, in the event of an escalated brushwar, the MACHETE will likely be passed over for an aircraft of this type. Furthermore, the SM27S MACHETE may be sold to the USAF to replace OA-10s in the FAC role. The average unit flyaway cost of these aircraft is approximately $15 million to $20 million, although Su-25s selling at $11 million have been reported.

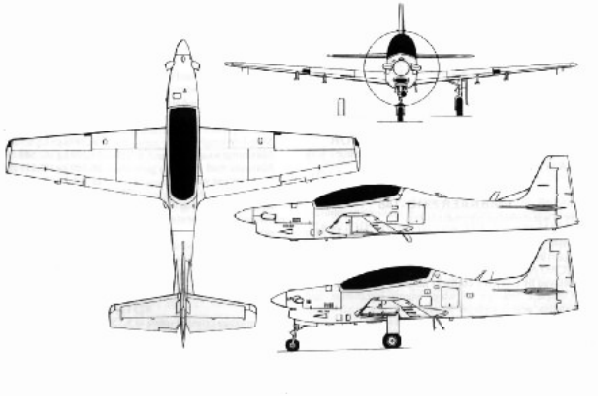
Reviewing all the potential competitors for the SM-27 MACHETE, it is apparent that some aircraft will serve as greater competition than others. The most likely competition which STAVATTI will face when marketing the SM-27 MACHETE abroad over the next ten to thirty years will come from four principal platforms: the Embraer EMB-314 Super Tucano/ALX, Raytheon T-6A Texan II and AT-6B Ranger, the PC-9/PC-21 and the Korean Aerospace Industries KT-1 and KO-1. While STAVATTI may face numerous other competitors as previously discussed, these four aircraft will likely be the most comparable, current production platforms which STAVATTI will compete against. These four aircraft also represent the primary competition faced by STAVATTI in the bid to satisfy the Colombian Air Force OV-10 and A-37 replacement requirement. In addition to STAVATTI, it was these four competitors who were also short-listed to satisfy the requirement in October 2004. Of the four, only one was from a US contractor-the Raytheon T-6A and AT-6B which has been produced in satisfaction of the JPATS requirement.

A detailed discussion of the EMBRAER, PILATUS, RAYTHEON and KOREAN AEROSPACE INDUSTRIES products are included respectively in the following pages. A performance/specification comparison of all five candidates and historical COIN platforms is also included in TABLE 5.0. Based upon a technical and performance analysis of the competition, the SM-27 MACHETE is technically superior, with greater performance accompanied by superior reliability, technology integration, supportability and value than any of its four principal competitors as established in the forthcoming section COMPETITIVE ANALYSIS.

PRINCIPAL MACHETE™ COMPETITOR PROFILE: EMBRAER SUPER TUCANO/A-29 ALX

EMB-314 Super Tucano/A-29 ALX

The EMB-314 Super Tucano is produced by Empresa Brasil De Aeronautica (EMBRAER). An advanced derivative of the EMB-312 which entered production in 1983 to replace Brazilian T-37s, the Super Tucano is currently being marketed worldwide as a new generation, multi-purpose military turboprop aircraft tailored for training, internal security missions, operation support missions, and COIN. The Super Tucano is produced in two versions: a single seat, for attack, air-to-air operations and reconnaissance, and twin seat, for night operations and attack, air-to-air operations and reconnaissance, electronic warfare and basic and advanced weapons familiarization. Both aircraft feature armor and redundant systems.



With over 600 Tucanos produced and sold to over 14 nations, the EMB-312/314 has been produced under license by Shorts to replace RAF Jet Provosts. An extremely popular trainer, the aircraft is powered by a 1,600 SHP Pratt & Whitney PT6A-68/3 turboprop engine driving a five-blade Hartzell propeller provided with an Engine Indication and Crew Alerting (EICAS) automatic engine monitoring and control system. Featuring tricycle landing gear and aluminum construction, a derivative of the Super Tucano entered development in 1995. Designated the A-29 ALX, this variant is a dedicated COIN aircraft with 99 ordered by the Brazilian Air Force for drug enforcement as well as ten ordered by the Dominican Republic .

SPECIFICATION A-29 ALX

Crew: 2
Powerplant: (1) 1,600 SHP PWC PT6A-68
Armament: (2) 0.50 cal guns/5 hardpoints
Wingspan: 36.5 ft
Length: 37.3 ft
Height: 13.0 ft
Wing Area: 208.8 sq ft
Empty Weight: 6,550 lbs
Internal Fuel: 1,190 lbs
External Load: 3,300 lbs
Gross Weight: 11,910 lbs
Stall Speed: 78 Kts
Max Speed: 303 Kts
Max ROC: 4,750 ft/min
Max Range: 810 Nm
Takeoff: 1,150 ft
Landing: 1,805 ft
G Limits: +7.5/-3
Wing Loading: 57.0 lbs/sq ft
Power Loading: 7.4 lbs/shp
Flyaway Cost: $5,000,000 to $8,000,000

CONTACT: EMBRAER
Box 343, Av. Brig. Faria Lima, 2170 Sao Jose dos Campos, SP, BRAZIL 12227-901
TEL: 123-451-711
FAX:123-451-090
http://www.embraer.com

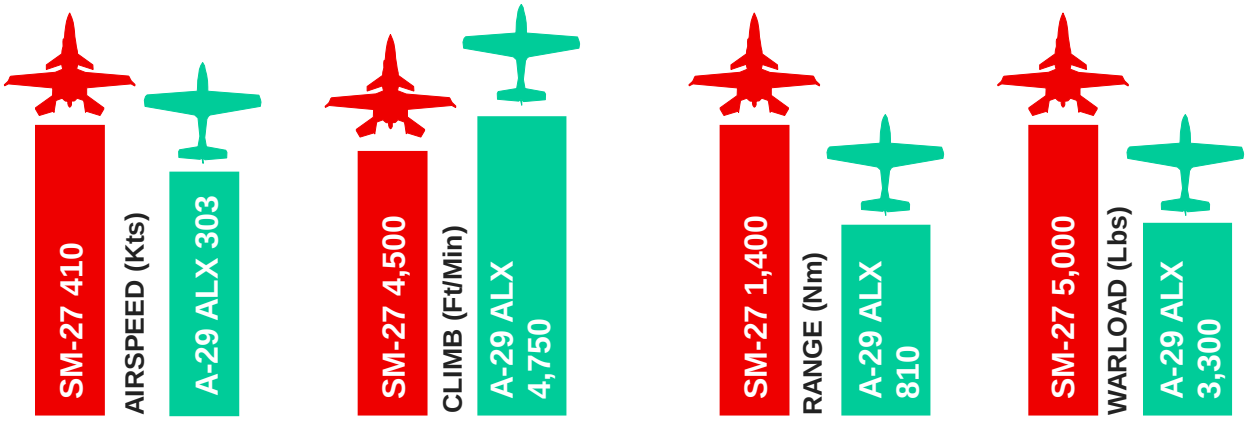
PRINCIPAL MACHETE™ COMPETITOR PROFILE: EMBRAER SUPER TUCANO/A-29 ALX

The A-29/Super Tucano airframe was designed with the last generation technology and computer based tools is capable of providing the new aircraft with a potential service life of 18,000 flying hours in typical training roles and/or 12,000 flying hours in an operational environment, depending on mission, loads and utilization. Crew survivability is ensured with armor protection, with self-protection being made available through provisions for missile approach warning system, radar warning receiver as well as chaff and flare dispensers.

The airframe has been designed for +7G/-3.5G load factors. An Airframe Structural Integrity Program (ASIP), based on the MIL-STD-1530 standards checks the aircraft airframe life. Armed with up to 3,300 lbs of external stores and (2) 0.50 cal machine guns, deliveries of production A-29s/AT-29s began in 2003 to the Brazilian Air Force.

A-29 ALX structure is corrosion-protected and the side-hinged canopy has a windshield able to withstand any bird strike impact at 300 kts. The cockpit environment has been enlarged to accommodate a wide range of male and female pilots with instrumentation upgrade to glass cockpit standard. Featuring a HOTAS flight controls arrangement, the Super Tucano employs Martin Baker ejection seats, as well as a forward crewstation HUD. The aircraft is also OBOGS, GPS and TCAS equipped and has Ring Laser INS.

SM-27S/A-29 ALX Performance Comparison



PRINCIPAL MACHETE™ COMPETITOR PROFILE: PILATUS PC-21/PC-9M

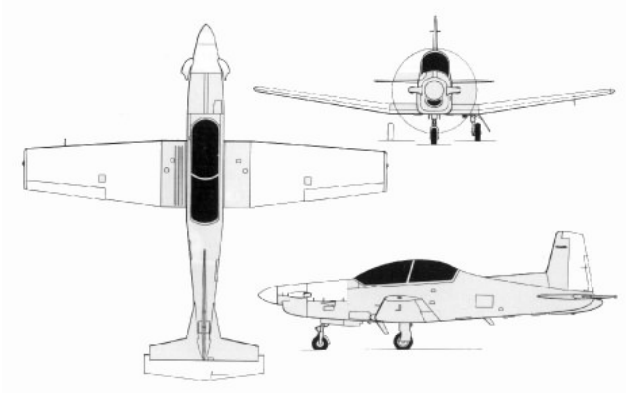
PC-21/PC-9M Turbo Trainer

PILATUS AIRCRAFT LIMITED

The PC-9 is a fully aerobatic, two place tandem advanced trainer. The PC-9 was developed in 1982 and entered production in 1985. Evolved from the PC-7 (which saw 525 units worldwide), PC-9 sales have exceeded 249 aircraft in ten countries. Although of similar layout and configuration, the PC-9 maintains 9% structural commonality with the PC-7, offering a larger cockpit, stepped Martin Baker Mk. CH11A ejection seats, single piece canopy and a ventral airbrake. In 1997 Pilatus introduced the PC-9M as the standard variant, offering an enlarged dorsal fin, modified wing root fairings, electronic power controls, Martin Baker MK 16 ejection seats and stall strips.

In November 1998, Pilatus initiated the private development of a 21st century PC-9 successor designated the PC-21, focused on three core objectives: 1) provide superior aerodynamic performance when compared to any other turboprop trainer on the market 2) provide a more powerful, flexible and cost effective integrated training system than any other turboprop or jet trainer in the world 3) a life cycle support cost that did not exceed current turboprop bench marks.

Not merely a derivative of the PC-9, the PC-21 is all-new, clean-sheet-of-paper design and is designed for basic, advanced and lead-in fighter training. Developed to address a market for over 1,000 new advanced trainers, the PC-21 is considered by Pilatus to "maintain Pilatus as the Number One Turboprop trainer manufacturer in the world."



SPECIFICATION
PC-21 Turbo Trainer

Crew: 2
Powerplant: (1) 1,600 SHP PT6A-68B
Armament: 5 hardpoints
Wingspan: 28.8 ft
Length: 36.7 ft
Height: 12.8 ft
Wing Area: 160.4 sq ft
Empty Weight: 4,960 lbs
Internal Fuel: 910 lbs
External Load: 2,292 lbs
Gross Weight: 9,370 lbs
Stall Speed: 80 Kts
Max Speed: 370 Kts
Max ROC: 4,090 ft/min
Service Ceiling: 38,000 ft
Max Range: 800 nm
Takeoff: 795 ft
Landing: 1,148 ft
G Limits: +8/-4
Wing Loading: 58.4 lbs/sq ft
Power Loading: 5.8 lbs/shp
Flyaway Cost: $5,000,000 to $8,000,000

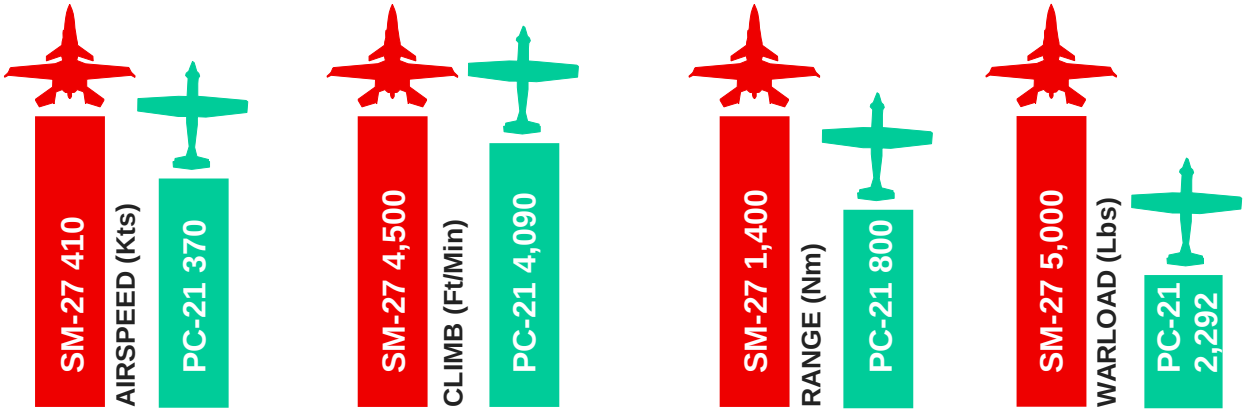
CONTACT: PILATUS FLUGZEUGWERKE AG
6371 Stans, SWITZERLAND
TEL 0041-41/619-6111
FAX: 0041-41/610-9230;
http://www.pilatus-aircraft.com

PRINCIPAL MACHETE™ COMPETITOR PROFILE: PILATUS PC-21/PC-9M

Considered an entirely new aircraft with significant advantages over the PC-9, the PC-21 features a PWC PT6A-68B turboprop with electronic power management and a five-blade graphite propeller, pressurized cockpit, on-board oxygen generation, Martin-Baker MK16L ejection seats and improved ailerons. The PC-21 cockpit features three 6 x 8 in AMLCDs, HUD and HUD repeater with a HOTAS flight controls arrangement. The PC-21 will offer configurable handling characteristics which allow aircraft handling to be changed to reflect the stage in the pilot training process, supplanting the need for a variety of trainer aircraft types. The PC-21 prototype initially flew in JUL 2002, was certified in NOV 2004 and entered production in DEC 2004.

In 1991 Pilatus teamed with Raytheon to compete in the US DoD JPATs competition, being awarded the contract in 1995. Originally designated the PC-9 MK II, Raytheon is producing the aircraft under license designation as the T-6A Texan II.

SM-27S/PC-21 Performance Comparison

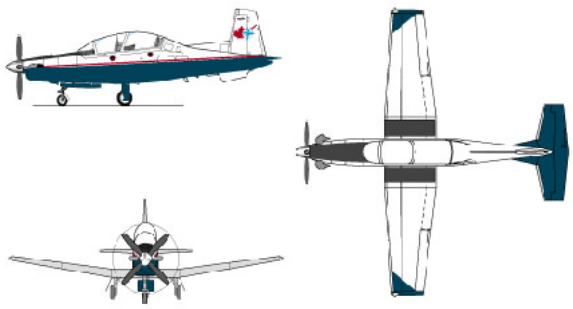


PRINCIPAL MACHETE™ COMPETITOR PROFILE: T-6A TEXAN II/T-6B

T-6A/T-6B Texan II

Raytheon

The Raytheon T-6A Joint Primary Air Training System (JPATS) is a two place tandem, single engine turboprop designed as a dedicated training aircraft, possessing jet-like handling characteristics. A replacement for USAF T-37 Tweet and USN T-34C Mentor trainers which are 37 and 22 years old respectively, the T-6A will offer superior performance with significant improvments in training effectiveness, safety, cockpit accommodation and operational capabilities. A total of 783 T-6A aircraft are to be procured domestically by the USAF and USN at a total procurement cost of approximately $4 billion. The T-6A also is being procured for the Canadian NFTC program (26 aircraft) and the Hellenic Air Force Training program (45 aircraft). USAF and USN transition to the T-6A is estimated to require 10 years, with the USAF steadily replacing T-37s with T-6As at all Air Education and Training Command joint specialized undergraduate pilot training bases. The first operational T-6A arrived in May 2000 with full rate production beginning in 2001. JPPT began in 2001 at Moody AFB. The USAF will procure 454 T-6As.



The T-6A cockpit is covered by a single, side-opening, non-jettisoned canopy. The T-6A offers birdstrike protection up to 270 kts which exceeds that of current training aircraft, and will improve the safety of landing and low-level training at Air Force and Navy bases. It has a pressurized cockpit to permit training at higher altitudes and reduce the stress on student pilots. The T-6A is equipped with an On-Board Oxygen Generating System (OBOGS) and Martin Baker MK 16L ejection seats.

SPECIFICATION
T-6A Texan II

Crew: 2 (student & instructor)
Powerplant: (1) 1,100 SHP PWC PT6A-68
Armament: 6 hardpoints
Wingspan: 33.5 ft
Length: 33.4 ft
Height: 10.7 ft
Wing Area: 175.3 sq ft
Empty Weight: 4,709 lbs
Internal Fuel: 1,163 lbs
External Load: 2,300 lbs
Gross Weight: 6,500 lbs
Stall Speed: 74 Kts
Max Speed: 316 Kts
Max ROC: 4,500 ft/min
Service Ceiling: 35,000 ft
Max Range: 900 nm
Takeoff: 1,775 ft
Landing: 1,900 ft
G Limits: +7.5/-3
Wing Loading: 37.1 lbs/sq ft
Power Loading: 5.9 lbs/shp
Flyaway Cost: $4,200,000-$6,200,000

CONTACT: RAYTHEON AIRCRAFT CO.
PO Box 85, Wichita, KS 67201 0085 USA
TEL: 316-676-7111
FAX 316-676-6614
http://www.raytheon.com

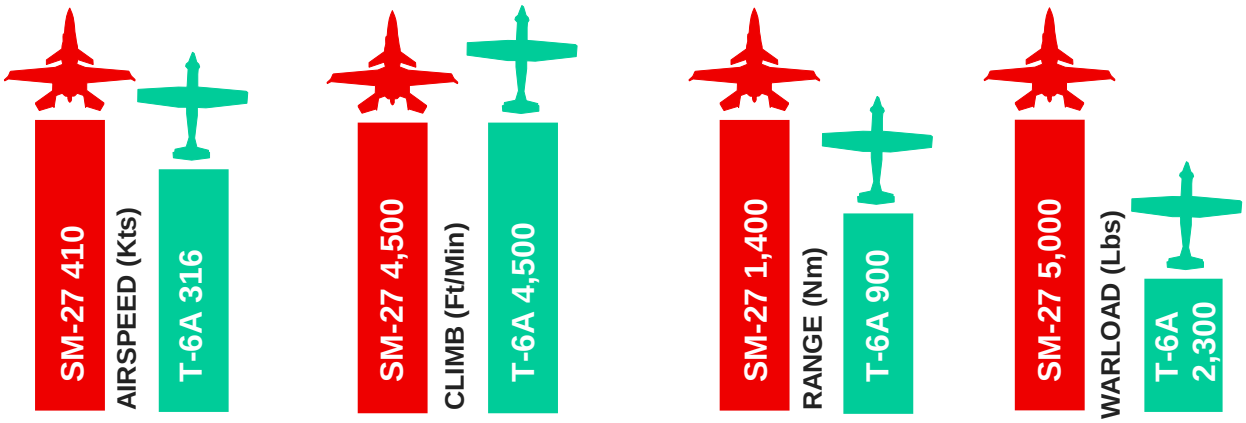
PRINCIPAL MACHETE™ COMPETITOR PROFILE: T-6A TEXAN II/T-6B

The T-6A has hydraulically actuated tricycle landing gear with differential brakes and nosewheel steering. The aircraft is fitted with hydraulically operated split flaps and a single, ventral speed-brake located between the flaps. All flight controls are manual, mechanically operated type with electric trim. Flight controls and avionics can be operated from both cockpits. A low wing training aircraft approved for day/night VFR/IFR, the T-6A cockpit is designed for a wide range of pilots, including petite females.

The T-6B (AKA AT-6B) is a COIN/ Weapon Trainer variant equipped with six external hardpoints, a Sparrow Hawk HUD, three MFDs and HOTAS. With certification anticipated in 2006 or early 2007, the T-6B will have a flyaway cost of about $6.2 million.

A license produced derivative of the PC-9, The T-6A incorporates improvements over the original Pilatus aircraft with over 90% of the structure strengthened to handle a larger powerplant, a higher MTOW, EFIS, ejection seats and a birdstrike resistant canopy.

SM-27S/T-6A Performance Comparison



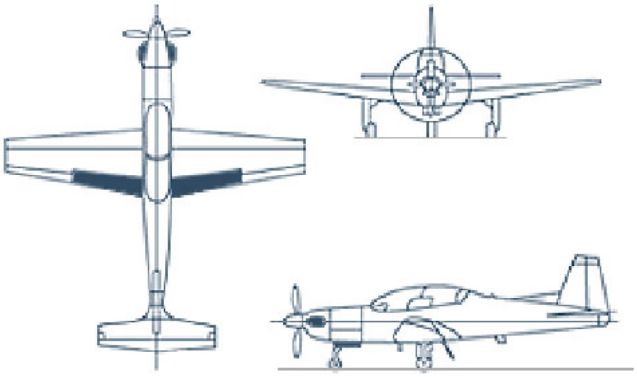
PRINCIPAL MACHETE™ COMPETITOR PROFILE: KOREA AEROSPACE INDUSTRIES KT-1 WOONGBEE/KO-1

KT-1/KO-1 Woongbee

According to Korea Aerospace Industries (KAI), the KT-1 is "The World's Best Trainer." Developed to replace aging T-37 Tweets in ROKAF service, the KT-1 development program was initiated in 1988 as a cooperative program between KAI and the Agency for Defense Development (ADD) utilizing indigenous technology. Ten years later, the KT-1 received production certification from the MoD for service as the basic trainer for the ROKAF. The first KT-1 was delivered in November 2000 with the first student pilot graduating from the KT-1 basic course in 2001.

Advertised as the first basic trainer to be designed 100% on computers (presumably using CATIA-CADM), the KT-1 is designed for superior maneuverability and outstanding performance. Said to have an unprecedented degree of stability, the KT-1 is allegedly the "only training aircraft in the world that can resume stability from an inverted spin." A two place tandem aircraft with stepped seating, the KT-1 is fully aerobatic and offers outstanding maintenance features. Incorporating an Aircraft Structural Integrity Program (ASIP), aircraft control surface configuration control and ILS, the KT-1 is cited for numerous advanced systems. The KT-1C Enhanced Trainer, equipped with a full-glass cockpit, OBOGs, "Anti-G," single point refueling and a Simulated Scoring Sytem for weapons training is under development.

KAI has been awarded a contract to provide KT-1s to Indonesia and is actively marketing the aircraft to South-East Asia and the Middle East.



SPECIFICATION
KO-1/KT-1 Woongbee

Crew: 2
Powerplant: (1) 950 SHP PWC PT6A-62
Armament: 6 hardpoints
Wingspan: 34.8 ft
Length: 33.7 ft
Height: 12.1 ft
Wing Area: 172.3 sq ft
Empty Weight: 4,210 lbs
Internal Fuel: Unavailable
External Load: 1,700 lbs
Gross Weight: 7,300 lbs
Stall Speed: 70 Kts
Max Speed: 280 Kts
Max ROC: 3,500 ft/min
Service Ceiling: 38,000 ft
Max Range: 900 nm
Takeoff: 800 ft
Landing: 1,300 ft
G Limits: +7.5/-3 Unarmed (+4.5/-2.3)
Wing Loading: 42.4 lbs/sq ft
Power Loading: 7.68 lbs/shp
Flyaway Cost: $3,000,000 to $8,500,000

CONTACT: KAI
#135 Seosomun-dong, Jung-gu, Seoul, 100-737 KOREA
TEL: 82_2_2001_3114
FAX: 82_2_2001_3011(2)
http://www.koreaaero.com

PRINCIPAL MACHETE™ COMPETITOR PROFILE: KOREA AEROSPACE INDUSTRIES KT-1 WOONGBEE/KO-1

On 29 May 2003, KAI initiated the development of the KO-1 FAC variant of the KT-1. The KO-1 is a armed variant capable of carrying at least 1,700 lbs of wing-mounted stores including external tanks and ordinance. The KO-1 is also equipped with fixed machine-gun armament. A light attack variant, the KO-1 is equipped with a HUD and MFDs as well as what is advertised as an "outstanding avionic system" including mission computers and INS/GPS.

Regarded as a next generation aircraft, KAI is also offering the KT-1B which is an enhanced variant of the KT-1 that was developed to enable pilots to prepare for both supersonic fighter aircraft and engage in combat withe light arms (machine guns). KAI projects the possible export of over 150 KT-1Bs, valued at over $500 million to some 20 countries by 2012. Extremely optimistic about their aircraft and its capabilities, KAI is actively marketing the KT-1 to a variety of customers in a number of different configurations, making the KT-1 the first indigenous Korean military export aircraft.

SM-27S/KO-1 Performance Comparison

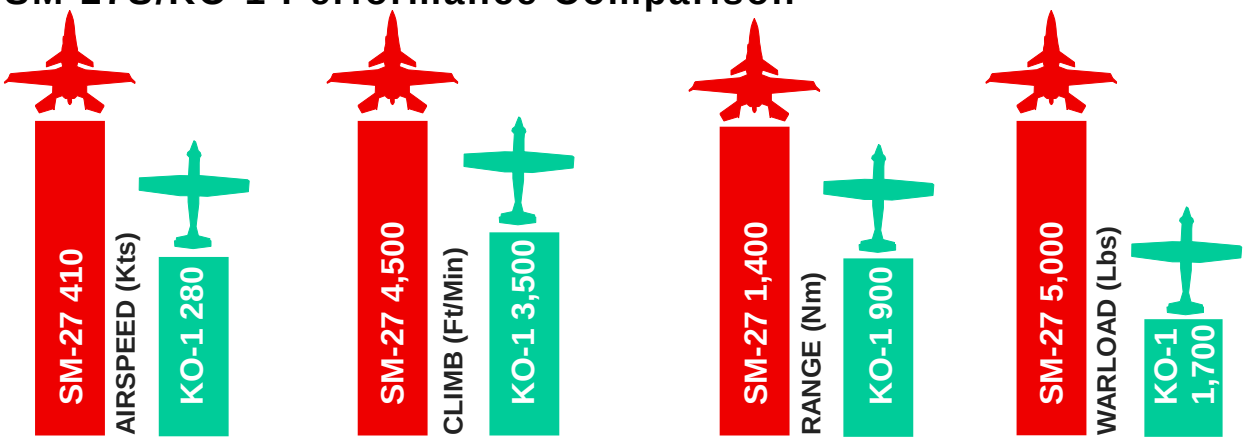
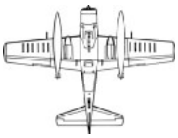


TABLE 5.0: PRESENT MACHETE COMPETITORS & HISTORICAL COIN

MANUFACTURER / AIRCRAFT PROFILED	STAVATTI SM-27 MACHETE™	EMBRAER SUPER TUCANO/ALX	RAYTHEON T-6A TEXAN II	PILATUS PC-21	KAI KO-1
					
Crew	1 to 2	1 to 2	2	2	2
Powerplant(s)	1 x PW127G	1 x PT6A-68	1 x PT6A-68	1 x PT6A-68B	1 x PT-6A-62
Max Power (SHP) or Max Thrust (LBS)	2,920 SHP	1,600 SHP	1,100 SHP	1,600 SHP	950
Span (ft)	43.0	36.5	33.4	28.8	34.8
Length (ft)	34.0	37.5	33.3	36.7	33.7
Height (ft)	12.0	12.8	10.7	12.8	12.1
Wing Area (sq ft)	194	209	175.3	160.4	172.3
MTOW (lbs)	15,500	11,910	6,500	9,370	7,300
Empty Weight (lbs)	7,120	6,550	4,709	4,960	4,210
External/War Load (lbs)	5,250	3,306	2,300	2,292	1,700
Internal Fuel (lbs)	2,600	1,186	1,163	919	NO DATA
Internal Fuel (USG)	400	183	164	141	NO DATA
Stores Stations (No.)	7	5	6	5	6
Internal Gun	1 x 30mm KCA	2 x 12.7mm	None	None	None
Maximum Speed @ SL (Kts)	350	303	316	300	280
Maximum Speed @ ALT (Kts)	403	303	316	370	350
Maximum Cruise @ ALT (Kts)	360	286	230	340	NO DATA
Stall Speed @ SL (Kts)	97	78	74	80	70
Maximum Climb Rate @ SL (ft/Min)	7,050	4,750	4,500	4,090	3,500
Service Ceiling (ft)	44,000	38,000	35,000	38,000	38,000
Tactical Radius, Internal Fuel (nm)	700	400+	400+	400+	450
Ferry Range, Internal Fuel (nm)	1,530	810	900	800	900
Maximum Range, External Tanks (nm)	3,600	1,721	NA	NA	NO DATA
Wing Loading (lbs/sq ft)	75	57	37.1	58.4	42.4
Power/Weight or Thrust/Weight	5 lbs/SHP	7.4 lbs/SHP	5.9 lbs/SHP	5.8 lbs/SHP	7.68 lbs/SHP
Load Limits (g)	7.5	7.5	7.5	8	7.5
Takeoff Distance (ft)	1,678	1,148	1,775	795	800
Landing Distance (ft)	2,081	1,804	1,900	1,148	1,300
Flyaway Cost (Millions USD)	6 to 9	5 to 9	4 to 7	5 to 8	3 to 8

MANUFACTURER / AIRCRAFT PROFILED	STAVATTI SM-27 MACHETE™	DOUGLAS A-1E SKYRAIDER	CESSNA A-37B DRAGONFLY	ROCKWELL OV-10A BRONCO	FMA IA-58 PUCAR'A
					
Crew	1 to 2	1	2	2 to 7	2
Powerplant(s)	1 x PW127G	1 x R-3350-26WB	2 x J85-GE-17A	2 x T76-G-416	2 x Astazou XVIG
Max Power (SHP) or Max Thrust (LBS)	2,920 SHP	3,050 HP	5,700 LBS	1,430 SHP	1,956 SHP
Span (ft)	43.0	50.8	35.8	40.0	47.5
Length (ft)	34.0	38.8	29.3	41.6	46.8
Height (ft)	12.0	15.8	8.9	15.2	17.6
Wing Area (sq ft)	194	400	184	291	326.2
MTOW (lbs)	15,500	25,000	14,000	14,444	14,990
Empty Weight (lbs)	7,120	12,313	6,211	6,969	8,862
External/War Load (lbs)	5,250	8,000	4,100	3,600	3,307
Internal Fuel (lbs)	2,600	NO DATA	3,307	3,757	2,205
Internal Fuel (USG)	400	NO DATA	507	578	277
Stores Stations (No.)	7	15	8	7	3
Internal Gun	1 x 30mm KCA	4 x 20mm	1 x 7.62mm	4 x 7.62mm	20mm & 7.62mm
Maximum Speed @ SL (Kts)	350	276	440	244	270
Maximum Speed @ ALT (Kts)	403	297	440	244	270
Maximum Cruise @ ALT (Kts)	360	164	425	194	259
Stall Speed @ SL (Kts)	97	No DATA	75	75	77
Maximum Climb Rate @ SL (ft/Min)	7,050	2,300	6,990	2,650	3,545
Service Ceiling (ft)	44,000	31,168	41,765	26,000	32,800
Tactical Radius, Internal Fuel (nm)	700	NO DATA	230	198	190
Ferry Range, Internal Fuel (nm)	1,530	1,300	399	NA	728
Maximum Range, External Tanks (nm)	3,600	NO DATA	878	1,240	2,002
Wing Loading (lbs/sq ft)	75	62.5	65.4	49.6	45.9
Power/Weight or Thrust/Weight	5 lbs/SHP	8.1 lbs/HP	0.41 to 1	10.1 lbs/SHP	7.7 lbs/SHP
Load Limits (g)	7.5	NO DATA	6	6	3
Takeoff Distance (ft)	1,678	NO DATA	2,596	2,800	985
Landing Distance (ft)	2,081	NO DATA	1,710	1,220	656
Flyaway Cost (Millions USD)	6 to 9	NO DATA	NA	NA	NA

COMPETITIVE ANALYSIS

Upon concluding a study of preceding competitor profiles and TABLE 5.0, it is evident that the SM-27 MACHETE offers superior performance, accompanied by superior reliability, technology integration, supportability and value than both principal anticipated competitors and those historical platforms designed to satisfy the COIN/CAS mission. A clear and objective case may be established for the superiority of the MACHETE over immediate competitors attempting to satisfy 21st century COIN/CAS/FAC requirements. Such an argument is readily supported through the recogntion of the following sixteen points:

1) The MACHETE is available in both single seat SM-27S and two-seat tandem SM-27T configurations. A dedicated COIN/CAS aircraft, for a variety of combat missions, a single pilot may satisfy all mission requirements, particularly as the MACHETE cockpit and integrated avionics permit significantly reduced work-load operations. Most of STAVATTI's immediate competitors are two-seat tandem aircraft, derived from trainers, with exception of the A-29 which may also be a single seat COIN. Unlike all immediate competitors including the A-29, the both the SM-27S and SM-27T incorporate an armored 30mm ammunition drum and significant extra volume for both internal fuel and avionics/EW equipment. The single seat SM-27S may carry greater ammunition in the void where the second seat is. Hence the MACHETE provides far greater ammunition and systems to satisfy the COIN mission than any current competitor.

Like all immediate competitors, the MACHETE is available in both a two place tandem Advanced Trainer and as a two place tandem COIN platform to satisfy such instances when an observer or RIO is required[14]. Hence the MACHETE offers greater flexibility than most competitors as it is available in a dedicated single seat combat and two seat trainer/combat configurations. Furthermore, as the MACHETE cockpit is a modular unit contained within a unitized armored "bath-tub" which is a fully integrated "plug-and-play" unit, it is conceivable for customer to procure a single MACHETE aircraft and two separate cockpit units of single and tandem seat type to permit one aircraft to serve as either a single seat or two seat aircraft as the mission may require. Such a modification from one cockpit type to another is estimated to require less than 3 hours using a two-main support crew. This results in significant overall savings and far greater value due to inherent MACHETE modular flexibility.

2) The MACHETE provides greater interior cockpit volume than any other two seat tandem or single seat CAS aircraft. Two place MACHETE cockpits measure over 131 inches in length with 115 cu ft, while single seat variants are 64 inches long with 55 cu ft. With a maximum cabin height of 64 inches, maximum cockpit width is 40 inches at the canopy junction tapering down to a minimum width of 30 inches at the cockpit floor. As a modular assembly, the cockpit "bath-tub" provides for a minimum armor thickness of 1.25 inches and a maximum thickness of up to 4.5 inches in particular regions, based upon fuselage contour. Accommodating benefiting from a sophisticated laminate armor consisting of molecularly pure Chromium plate (one of the hardest substances known to man) backed by Honeywell SPECTRA 2000 ballistic fiber, the MACHETE cockpit module permits greater armor thickness and configuration styles than any competitor aircraft. Designed for installation of either Martin Baker Mk. 16 or the ACES II ejection seats, the MACHETE cockpit offers superior leg-room, shoulder-room and headroom.

3) The SM-27S features an integral, starboard fuselage "air-stair" boarding ladder of 18 inch width and 32 inch stowed height. Similar to the boarding system of the A-6 Intruder/EA-6B Prowler, the SM-27S air stair is located immediately forward of the canard foreplane, which is structurally reinforced to serve as a stepping platform to facilitate cockpit entry. The air-stair is pneumatically operated with mechanical interlock. Fully extended, the air-stair provides a ladder of 64 inches total length offering six rungs of 12 inch spacing and a minimum 4.5 inch rung depth. The bottom rung of the air-stair stands only 18 inches from the ground-line, providing overall ease of crew entry. The two seat SM-27T features both port and starboard air-stairs to permit simultaneous forward and aft crew-member entry and egress. Rated for 350 lb occupants, the air-stair system offers unparalleled access to the aircraft without requiring external support.

4) The SM-27 offers greater internal avionics and systems bay volume than any of its immediate competitors. Consisting of a forward nose avionics bay, cockpit avionics bay and mid-fuselage avionics bays the SM-27T provides a total volume of 42 cu ft while the total avionics and systems volume for the single seat SM-27S is over 85 cu ft. Accessible through hinged external hatches, these avionics and systems bays offer significant volume to house a variety of LRUs and accommodate anticipated growth.

5) Most COIN competitors now offer fully glass cockpits and a HUD, however, the MACHETE is the only COIN aircraft to offer three distinct instrument panel configurations for forward and aft crew stations including not only the integration of a Sparrow Hawk Wide-Field-Of-View HUD, but also up to two 6 x 8 in or three 5 x 7 in color MFD LCDs augmented by STAVATTI's trademark Panel Perimeter Analogue display system, efficiently displaying critical aircraft instruments displayed in a traditional format around the parameter of the instrument panel for immediate recognition. Offering Mason Electic HOTAS and a full-deflection centrally mounted control column and full-deflection rudder pedals, the MACHETE panel uniquely blends advanced and traditional avionic display systems.

6) The MACHETE environmental control system not only benefits from a MSOGS eliminating LOx requirements, but offers an air conditioned, pressurized environment with radiant, liquid heat provided by the aircraft avionics/system heat-exchanger.

7) The MACHETE offers a truly open-architecture in terms of avionics and systems. Rather than being limited to a specific configuration, the SM-27 design permits customers to select a wide variety of "plug-and-play" LRUs to result in unique MACHETE sensor, communications, navigation, stores management, weapons delivery and electronic warfare systems configurations. By combining voluminous avionics bays with "flexible shelving/mounts and wiring harnesses," a MIL-STD-1553B data bus, a resilient and hardy power supply and TEMPEST shielding, the SM-27 is capable of handling a host of avionics and systems as LRUs or multi-mission, software driven integrated boards. Offering greater avionics complexities than most aircraft in its class, the SM-27 is available with a number of sophisticated systems including the SMS 2100 stores management system, AN/ARC-210(V) COM, AN/APX-100(V) IFF, AN/ASN-166 GPS/INS and either RDR 2100 weather radar, APG-66(H), APG-67 or Elta EL/M-2001B combat radar.

8) The MACHETE offers a flexible, fully-integrated Electronic Warfare/Electronic Counter Measures system, including a variety of optional, customer selected systems such as RWRs, LWS, MAWs and SPJs as produced by Elisra, Elta, Raytheon and BAE Systems. Providing sophisticated levels of protection, the MACHETE has been designed to incorporate the finest ECM systems available for its class, on par with many fighters including the F-16C, F-15E and F/A-18E/F. Hallmark ECM systems include the first production application of the Raytheon AN/AAR-58(V), one of the world's most advanced MAWS as well as adequate volume for between 10 and 16 AN/ALE-47 countermeasures dispensers as standard equipment mounted in the aircraft empennage support booms and ventral wing-tip fairings.

9) The MACHETE is of a distinctly unique configuration. Incorporating a three-surface arrangement, the SM-27 is of pusher configuration with twin vertical stabilizers, lift producing canard foreplanes, an all-moving empennage and a long, voluminous nose that permits significantly greater visibility than any competitor platforms, short of the A-10 and Su-25. The MACHETE does not "look" like any of its competitors, all of which are extremely similar in configuration and arrangement. Although argued as being "new" aircraft, for all intents and purposes, the T-6A is a slightly modified PC-9M produced under license, resulting in a nearly identical aircraft. The PC-21, although considered a "clean-sheet-of-paper" design is in fact nearly identical in configuration, arrangement and construction as the PC-9. The A-29 is in fact nearly identical to the EMB-312, itself stunningly similar to the PC-7 and PC-9. The KT-1 and KO-1, while argued as being developed from "indigenous technologies," is of nearly identical design and arrangement to the PC-9 and PC-21 which makes it suspect from the standpoint of true originality and innovation.

The four profiled competitors do not incorporate any stunning new or advanced aerodynamic configurations. They are the status quo and as such continue to employ a configuration whereby a tractor engine drives an aircraft which has low wings of moderate aspect ratio, a single vertical stabilizer, a semi-streamlined fuselage not optimized for maximum volumetric efficiency and a horizontal stabilizer situation in a location less-than-ideal for maneuvering, efficiency and departure recovery. Simply put, the MACHETE configuration is not only unique, but due to the relative placements of the wing, horizontal stabilizer and canard foreplanes, results in both departure resistance and more immediate recovery in the event of departure, resulting in over-all greater controllability throughout the flight regime.

10) The MACHETE has more power than any of its turboprop competition. Fitted with the proven Pratt & Whitney Canada PW127 engine which also powers the Fokker 60, ATR 42-500, ATR 72-210, ATR 72-500, and CASA C-295, the MACHETE engine is an advancement over the earlier PT-6 turboprops which drive all four primary competitors. With a total of 2,920 SHP at SL, the SM-27 has over 1,300 more SHP than

any competing aircraft, including the PC-21 and A-29. The SM-27 has 1,720 more SHP than the T-6A. With this significant power, the SM-27 demonstrates flight performance characteristics that exceed the maximum level speed, maximum rate-of-climb, take-off distance, acceleration and power-loading as its four main competitors at MTOW with 5,000 lbs of external stores (modeled as five GBU-31 JDAMs). Arranged in a pusher configuration driving a six, blade, scimitar contra-rotating constant speed propeller, the SM-27 propulsion system is designed for transonic efficiency and maximum thrust production. Due to contra-rotation, the SM-27 remains unaffected by propeller P-Factor and torque effects. Thanks to its pusher configuration and flexible engine bay design, the SM-27 may be readily developed into turbofan powered variants, such as the SM-7 SUPER MACHETE, which is a virtual impossibility for all other turboprop competitors that rely upon traditional tractor arrangements.

11) The MACHETE has a Maximum Takeoff Weight (MTOW) of 15,500 lbs which is over 4,600 lbs greater than the A-29 ALX and nearly twice that of the T-6A. It is the only candidate to match the original MTOW of OV-10s and A-37s, which the MACHETE is designed to replace. This higher MTOW is the combined result of a slightly higher aircraft empty weight than most of the competition, but more critically, a greater maximum internal fuel load and external ordinance load than competitors. The SM-27 offers a maximum fuel fraction of 0.18 which translates into 2,600 lbs or nearly 200 gallons more fuel than most competitors. This greater internal fuel load translates into a tactical radius which is often 300 nm further than nearly all other new turboprop COINs and equal to a 4.5 hour endurance at a cruise speed of over 300 kts. The SM-27 external warload is 5,250 lbs. This warload is 2,000 to 3,000 lbs greater than the warload of the nearest turboprop competitors and equal to a warload fraction of 0.35. In general, the MACHETE carries more weapons and fuel than any other current production turboprop COIN, yet outperforms all of these aircraft while fully-loaded, with exception of the ALX which climbs at 200 ft/min faster, albeit with 1,700 lbs less ordinance and more than 200 gallons less fuel!

12) In addition to carrying more ordinance, the SM-27 features a total of seven external hardpoints, equipped with NATO standard 14-in or 28-in suspension lugs. Six of these hardpoints are plumbed for external fuel tanks up to 230 gallons volume. Anticipated to be qualified for a wide variety of external stores ranging from the AGM-65 to the GBU-24, the SM-27 is the only 21st century turboprop COIN to be developed to incorporate B-61 MOD 11 delivery capability. Offering significant anti-tank capability, the SM-27 may be equipped with an internal port mounted Orelikon KCA 30mm cannon or GD GAU-13/A 30 mm cannon with 250 rds. The GAU-13/A cannon is a short-barrel derivative of the GAU-8/A cannon of the A-10 Thunderbolt II capable of delivering the popular GD PGU-14/B API, PGU-13/B HEI and PGU-15/B TP ammunition. The SM-27 is not only the only turboprop COIN to feature this level of firepower, but can *accurately* wield this weapon system, made possible due to the significant moment of inertia associated with the MACHETE, as well as the inherent stability achieved through the use of twin vertical stabilizers of substantial area and automatic hydromechanical rudder deflection to counteract recoil. In addition to these tank splitting cannons which enable the MACHETE to wield significant anti-tank capability, the SM-27 may be equipped with a host of 30mm chain guns (M230LF), 25mm to 50mm Bushmaster III cannons or up to four wing or nose mounted 0.50 cal machine guns, including the ATK Bushmaster and FN Herstal M3Ms. The SM-27 offers greater firepower and warload than any current production turboprop COIN, the OV-10, A-37 or Pucara, second only to the A-10, Su-25 and the 8,000 lb warload of the A-1 Skyraider.

13) Incorporating advanced materials, including scandium aluminum, titanium, high temperature graphite/ polyimide and chromium/SPECTRA metal matrix composite armor, the SM-27 has an sophisticated structural composition. Although traditional Alclad alloys such as 7075, 7050 and 7150 aluminum are used in SM-27 wings, the MACHETE is the only COIN platform to feature a geodetic fuselage subframe composed of laser fused titanium and scandium aluminum elements. Employing construction techniques pioneered in the extremely survivable Vickers Wellington Bomber of WWII, the SM-27 MACHETE is an example of a more sophisticated comprehension of engineering, geometry and material science than competitor turboprops. The SM-27 MACHETE is extremely corrosion resistant and built for a fatigue life of over 15,000 flight hours, roughly equivalent to a 30 year service life.

Although composed of advanced materials with high strength-to-weight ratios, the SM-27 has an empty weight comparable to most turboprop COINS. This is due in part to the use of a larger powerplant and greater number of substantial avionic system than its competition. This is also the direct result of using significant volumes of advanced materials. Simply put, the SM-27 has more structural material, in the form of substantial spars, bulkheads and skins used throughout the aircraft. Built to a +7.5/-3 load factor at

MTOW, the SM-27 is capable of high-g maneuvering with a 5,250 lb external load (highly desirable for UCAV configurations). This design limit load factor is one-g grater than the nearest competitor, the PC-21.

Inherently thicker skinned to permit higher dynamic pressure, load factors and a high VMO and dive speed than typical turboprop COINs, the SM-27 offers over 500 lbs of dedicated ballistic SPECTRA/Chromium armor in critical aircraft zones including the cockpit, engine bay, avionics bay and ammunition drums. Benefiting from self-sealing, sealed-cell fuel tanks in the wings and fuselage, the SM-27 features duplicate mechanical control linkages and principal system support lines, including hydraulics and electrical lines. With a polycarbonate bubble canopy resistant to the impact of a 4 lb bird at 450 kts, the SM-27 offers uniquely high crew survivability in the form of armor and structure.

14) The SM-27 employs a more sophisticated and effective combination of aerodynamics and high lift devices than any competitor. The SM-27 features and efficient, twisted wing with and aspect ratio of 8.9 and trailing edge, double slotted Fowler flaps with ailerons and spoilers for roll-control. Coupled with vortex generating canard foreplanes for improved STOL performance and an all moving horizontal tail to enable more than 40º flap deflection without loss of pitch authority, the SM-27 has the ability to generate higher maximum lift coefficients than any competitor aircraft, including the PC-9M which employs less effective split flaps. Combining a 75 lb/sq ft wing loading with a close coupled, high aspect ratio wing, the SM-27 will offer greater high speed, low-level ride performance than lower wing loading competitors while enabling an efficient, high-speed cruise. Despite the higher wing-loading, the application of sophisticated high-lift devices and a powerful engine result in an aircraft which can satisfy the OV-10 and A-37 mission while demonstrating a shorter take-off and landing distance at MTOW than either earlier aircraft.

15) The MACHETE maximum level speed (VMO) exceeds that of the ALX by 50 kts at sea level and is over 100 kts faster than either the ALX or T-6A at altitude. Generally speaking, the SM-27 MACHETE is faster at all altitudes than any of the four prospective turboprop COIN competitors. Considering the fact that the MACHETE's VMO is based upon a loaded configuration with 5,250 lbs of external stores (modeled as five GBU-32 JDAMS), the SM-27 will likely demonstrate significantly higher maximum level speeds than any prop-driven COIN in production. Recognizing that the maximum level speeds of the A-10 and A-37 are approximately 400 kts and 440 kts respectively, an SM-27 in the clean configuration will likely outpace either aircraft at altitude. Designed for a MACH 0.73 Never-Exceed Speed (482 kts), the MACHETE's dive speed is limited not by structure, but critical MACH number of the 5º swept wing.

16) With an estimated average unit flyaway cost of approximately $8.4 million ($8.2 million for the SM-27S and $8.6 million for the SM-27T), the MACHETE offers exceptional value in light of its competition. Actual flyaway costs of individual aircraft are often difficult to ascertain. It is known, however, that the average cost of the T-6A is approximately $4.25 million, while the T-6B will likely enter production with a $6.2 million flyaway cost for an international customer[15]. Based upon the cost of the T-6B alone, it is apparent that the SM-27T MACHETE, priced at only $2.4 million more, offers significantly greater value than the less capable T-6B. Furthermore, it is STAVATTI's belief that by the time the SM-27 enters production, all four competitor aircraft will be offered at a significantly greater price than the MACHETE due not to inflation, but the economics of their non-lean, non-efficient enterprise. It is highly probable that both the PC-21 and A-29 are being sold today at a price greater than that of the MACHETE while lacking a number of systems offered as standard equipment on the SM-27 series. The SM-27 is priced competitively, but will ultimately be recognized as providing significant overall value while exceeding the performance and capabilities of contemporary turboprops modified for COIN.

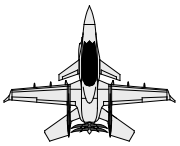
SUPER-COIN

The competitive analysis and data of TABLE 5.0 reveals that the SM-27 MACHETE is a different type of aircraft and weapon system than any of the four, current production contemporary turboprop COIN competitors. Designed to satisfy the Super-COIN role of 1966 which resulted in the A-10, the SM-27S MACHETE is in fact more like the A-10 or Su-25 than it is like a Super Tucano/ALX, PC-21 or OV-10 Bronco. As previously discussed, the primary difference between an A-10 type platform and the MACHETE, is the requirement to dispatch coordinated armor on the battlefield. As the SM-27S MACHETE is designed to satisfy the CAS role in regions of Canopy Jungle or Mountainous Terrain, the aircraft is not designed to engage more than one to three tanks/armored target per sortie, unless armed with appropriate external stores such as six AGM-65s. This reduction in tank-decimation-per-sortie requirement allows the SM-27S

to carry a lighter, precision orientated warload than the A-10 and accomplish the same SUPER-COIN mission that the A-10 was originally designed for when the SUPER-COIN requirement was initial developed in the late 1960s and early 1970s. The MACHETE does have, however, a wing loading and power loading which is largely similar to that of the A-10, promising A-10 type performance at about one fourth the cost. Able to carry advanced weapons such as the GPS guided GBU-31 and GBU-32 JDAMs, as well as laser guided ordinance, the MACHETE has the ability to annihilate targets which the A-10 would typically dispatch, with less cost and more precision than the A-10 could when originally introduced. Featuring copious levels of advanced armor, redundant systems and aerodynamic surfaces which will sustain significant battle damage while permitting continued flight operations, the SM-27 is "built like an A-10," resulting in a platform which could ultimately exceed the OV-10A in more roles than FAC.

Comparing SM-27S MACHETE performance directly with the A-10A Thunderbolt II, and its foreign cousin, the Su-25 Frogfoot, in TABLE 6.0, it becomes evident that the MACHETE is not merely a COIN platform similar to the Super Tucano/ALX, PC-21 or OV-10, but a SUPER-COIN designed to satisfy a modified A-X requirement, now extremely relevant as the US and coalition forces wage wars of counter-insurgency:

TABLE 6.0: MACHETE SUPER-COIN COMPARISON

MANUFACTURER AIRCRAFT PROFILED	STAVATTI SM-27 MACHETE™	FAIRCHILD A-10A THUNDERBOLT II	SUKHOI Su-25K FROGFOOT	SCALED RUTAN 151 ARES
				
Crew	1 to 2	1	1	1
Powerplant(s)	1 x PW127G	2 x TF34-GE-100	2 x R195	1 s JT15D-5
Max Power (SHP) or Max Thrust (LBS)	2,920 SHP	18,130 LBS	19,840 LBS	2,950 LBS
Span (ft)	43.0	57.5	47.1	35.0
Length (ft)	34.0	53.3	50.9	25.5
Height (ft)	12.0	14.7	15.6	10.8
Wing Area (sq ft)	196	506	324	191
MTOW (lbs)	15,500	50,000	38,645	6,700
Empty Weight (lbs)	7,120	24,959	20,950	3,600
External/War Load (lbs)	5,250	16,000	9,700	900
Internal Fuel (lbs)	2,600	10,700	6,614	2,200
Internal Fuel (USG)	400	1,646	951	333
Stores Stations (No.)	7	11	10	4
Internal Gun	1 x 30mm GAU-13	1 x 30mm GAU-8	1 x 30mm A0-17A	1 x 25mm GAU-12/U
Maximum Speed @ SL (Kts)	350	381	475	305
Maximum Speed @ ALT (Kts)	403	380	526	375
Maximum Cruise @ ALT (Kts)	360	336	513	210
Stall Speed @ SL (Kts)	97	NA	108	78
Maximum Climb Rate @ SL (ft/Min)	7,050	6,000	5,000+	NA
Service Ceiling (ft)	44,000	45,000	32,810	NA
Tactical Radius, Internal Fuel (nm)	700	540	380	NA
Ferry Range, Internal Fuel (nm)	1,530	2,130	1,053	1,150
Maximum Range, External Tanks (nm)	3,600	2,454	1,450	NA
Wing Loading (lbs/sq ft)	75	99	107	32.4
Power/Weight or Thrust/Weight	5 lbs/SHP	0.37 to 1	0.51 to 1	0.48 to 1
Load Limits (g)	9	7.33	6.5	8
Takeoff Distance (ft)	1,700	4,000	1,970	1,500
Landing Distance (ft)	2,100	2,000	1,312	2,000
Flyaway Cost (Millions USD)	6 to 9	18	11	1 to 5

In terms of flight envelope, maximum level speeds, power-loadings, load-limits, short field capability and tactical radius, it is evident that the SM-27 is a more appropriate platform than the A-10, or for that matter the Su-25, for the delivery of precision guided stores, or the designation of targets using marker rockets.

A comparison of the MACHETE to the Rutan Model 151 ARES, developed by Burt Rutan, is also included in TABLE 6.0. The ARES presents a lower maximum speed, longer field length requirements, shorter range, lack of armor and significantly less warload, firepower and maximum thrust than the MACHETE. Although equipped with an UPCO ejection seat, the mold-less composite construction technique employed throughout the aircraft significantly limits the degree to which armor, LRUs and related systems may be integrated within the aircraft, reducing overall survivability and system effectiveness. The canard

and wing configuration, although highly efficient, severely limited the degree to which wing flaps could be utilized, hence reducing overall wing lift coefficient. Physically smaller than the SM-27 and equipped with only four hardpoints and a single 25 mm cannon, it is STAVATTI's opinion that the ARES represents an aircraft suitable primarily for the FAC/SAR mission. Competitively priced for air forces with limited budgets, the ARES (Agile Response Effective Support) was originally developed as a low cost military and paramilitary aircraft.

Stimulated by the Army's Low Cost Battlefield Attack Aircraft (LCBAA), the ARES was a privately funded, internal undertaking of Scaled Composites Inc. between 1985 and 1991. First flight of the sole acknowledged ARES prototype was in February 1990. Although live firing tests of the aircraft armament were funded by the USAF, the ARES has yet to enter production and as of yet has received no orders. Although STAVATTI has utmost praise for Burt Rutan and this weapon system, it is STAVATTI's belief that the ARES will not serve as a principal competitor to the SM-27 MACHETE.

FINAL ANALYSIS

The SM-27 MACHETE is a superior aircraft for the COIN/CAS/FAC role than the A-29 ALX, PC-21, T-6A/T-6B and the KT-1/KO-1. The MACHETE has been designed specifically for the COIN mission as a bona-fide new and original configuration and concept. Although capable of satisfying the COIN mission to a limited degree, these four principal competitor platforms are most well suited for service as Advanced Trainers, for which they were originally designed.

The SM-27 is developed to address COIN/Advanced Trainer requirements from approximately 2010 through 2040. The MACHETE is a DCS/FMS COIN for Joint-Vision 2025. The MACHETE is the only all-new single engine turboprop in its class which can be considered a new-from-the-ground-up next generation platform. The principal anticipated COIN competitors for the MACHETE are not *new* designs, but *legacy* systems derived from trainers!

The PC-9 is a 1997 edition of a 1982 aircraft based upon the 1978 PC-7. The T-6A is a licensed produced derivative of a PC-9 from 1995-again a 1978 aircraft. Although advertised as an all-new design, the PC-21 is extraordinarily similar in configuration and concept tot he PC-9 and represents very little in terms of new design or innovation. It is the third iteration of a three aircraft legacy which began with the 1978 PC-7 from which Pilatus Trainers has failed to deviate from. The EMB-314/A-29 ALX is a 1999 upgrade of a 1980 aircraft designed in 1978. Of the turboprop competitors, three are not new designs, but instead improved variants of aircraft developed in 1978. The KO-1 is a 2003 derivative of the KT-1 which was designed in 1988 but did not enter production until 2000. Although a new aircraft, the KO-1 is extremely similar in configuration and technology to the PC-9, ALX and T-6A.

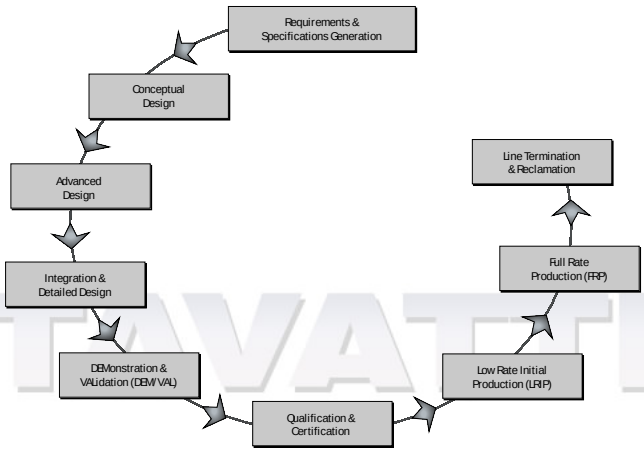
Simply put, all of the MACHETE's turboprop COIN competitors are based upon designs and configuration philosophies that are at least 25 years old. They are out-dated. By the time the MACHETE enters peak production, it will be the only all new system to satisfy the COIN mission, competing with platforms that are themselves facing obsolescence. Frankly speaking, by 2025 the MACHETE will be serving as a direct successor to the aircraft presently considered turboprop competition!

As wars of terror and insurgent aggression are increasing in prevalence, the market need for the MACHETE™ aircraft is rising. Originally conceived during a time of relative peace, the MACHETE™ program now has particular poignancy in the wake of 9/11. Offering significantly greater speed, survivability, payload, armament and endurance than helicopter gunships and far greater endurance, efficiency and economy in the COIN role than either the A-10 or Su-25, the MACHETE™ satisfies the COIN mission distinctly. A rugged flexible platform, the MACHETE is designed to deliver a significant quantity of precision guided ordinance while sustaining substantial small arms fire and direct hits from Man-Portable SAMs. Created with Pacific Rim republics in-mind, the MACHETE is the only all-new long-range COIN.

VIII. MACHETE PROGRAM OUTLINE

The SM-27 MACHETE is a development of the Tactical Air Warfare Systems Division of the Military Aerospace Enterprise of STAVATTI. STAVATTI CORPORATION was the responsible “owner” of this program through 2004. In 2005 “ownership” of the SM-27 MACHETE program was adjusted to permit development and production of the SM-27 MACHETE as a Joint-Venture of STAVATTI HEAVY INDUSTRIES.

The MACHETE Program encompasses all phases of aircraft development and production. For the purposes of this document, the MACHETE program can be divided into two areas: Research, Development, Test & Evaluation (RDT&E) and Production. RDT&E results in the development of a product which is fully developed, qualified and ready for production, while Production results in the manufacture and distribution of a product in support of the projected business case and for the generation of revenue/ROI. The MACHETE Program consists of nine phases including **Requirements and Specifications Generation; Conceptual Design; Advanced Design; Integration and Detail Design; Demonstration and Validation; Qualification and Certification; Low Rate Initial Production; Production, Service and Support; and Line Termination and Reclamation.**



Of these phases, six are considered to be aspects of RDT&E (Requirements and Specifications Generation; Conceptual Design; Advanced Design; Integration and Detail Design; Demonstration and Validation; Qualification and Certification) and four are considered to be aspects of Production (Low Rate Initial Production; Production, Service and Support; and Line Termination and Reclamation). A complete discussion of the MACHETE Program, including RDT&E and Production is presented.

The concept behind the MACHETE has existed since August 1995 when STAVATTI began development of the SLEEK Sportplane series. The SLEEK is a High Performance Sportplane designed to deliver fighter-like handling. Designed for performance and comfort, the SLEEK platform provided allowances for modification into a light attack/COIN platform. Between September 1995 and May 1997, STAVATTI conducted numerous design studies for a militarized/COIN variant of the SLEEK platform. Thus the conceptual design of the MACHETE has been an ongoing process within STAVATTI for at least two years. In 1997 STAVATTI initiated a business plan which focused on the RDT&E of the F-26 STALMA Multi-Role Fighter and the SLEEK sportplane. Concentrating primarily upon these two designs, further development of the MACHETE was suspended until August 2000.

Prompted by a Pacific Rim COIN requirement, STAVATTI reinitiated development work on the MACHETE in August 2000. The MACHETE RDT&E program began on 25 August 2000 with the initiation of the Requirements and Specifications Generation phase. This phase resulted in the definition of the design requirements and general specifications to which the MACHETE would be designed. This phase considered the general mission requirements associated with a COIN platform as well as the original specifications of the 1966 A-X Super-COIN. The Requirements and Specifications Generation phase was completed on 29 August 2000.

On 30 August 2000, STAVATTI initiated the Conceptual Design phase. Within the Conceptual Design

AN EARLY RENDERING OF THE **SM-27 MACHETE™** CIRCA 2002.

phase STAVATTI developed the MACHETE design from a conceptual standpoint. Numerous final configurations for the MACHETE were analyzed. Preliminary aircraft weights and loadings were calculated. Critical aircraft subsystems, including powerplant, escape system, armament, avionics, landing gear, etc. were considered. Conceptual aircraft structure and internal arrangement were developed and all major airframe systems were defined. Initial aircraft performance curves were generated and conceptual costs were developed. The conceptual design phase focused heavily upon industry standard statistical analysis and ensuring that from a conceptual standpoint, the MACHETE platform as configured to meet its designated Requirements and Specifications was a viable aircraft. The Conceptual Design phase was completed on 23 October 2000.

On 24 October 2000 STAVATTI initiated the Advanced Design phase. The Advanced Design phase converted the conceptual MACHETE into a functional, producible design. Final selection of core aircraft subsystems including powerplant, avionics, control systems major sensor and countermeasures systems, armament, etc. was performed. Qualified and preferred subcontractors and participating prime contractors were invited to participate in the MACHETE Industry Team. Critical aspects of final aircraft configuration including airfoil sections, high lift devices, landing gear type, etc. were incorporated into the design. Computational flight control and system architecture were considered. The MACHETE configuration was drafted, lofted, analyzed and optimized. A preliminary three-dimensional model of the MACHETE was constructed in 1/12 scale. Renderings of the MACHETE in combat configuration for marketing purposes were created as were 3-Dimensional surface and solid CAD models.

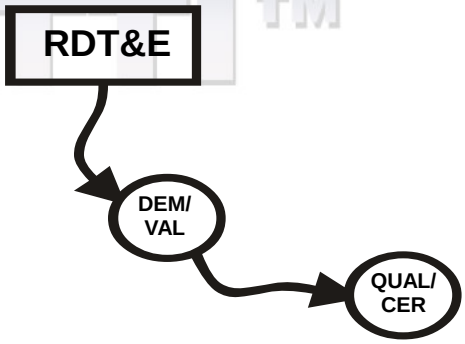
During Advanced Design, the final MACHETE external arrangement was defined and fluid dynamic computations were initiated. The final MACHETE internal structure was defined and FEA analysis was initiated. A final MACHETE line-card was developed. STAVATTI began marketing the MACHETE to potential allied customers and began seeking export clearance for the MACHETE from the US State Department-Office of Defense Trade Controls. The Advanced Design phase was completed on 27 November 2000. On 28 November 2000 STAVATTI initiated the Integration and Detail Design phase. The Integration and Detail Design phase will result in the intricate design of aircraft components as well as the final selection of aircraft component suppliers/MACHETE Industry Team Members (ITMs).

Integration and Detail Design has been on-going through 2004. Completion of the Integration and Detail [redacted] months, the remainder of Integration and Detail Design begin conducted concurrent with wind tunnel testing, in-flight simulation and initiation of construction of Prototype Air Vehicle (PAV)-1.

This program document focuses specifically upon what steps are necessary to place the MACHETE into [redacted]

The remaining portions of MACHETE RDT&E Program as undertaken by STAVATTI, consisting of Demonstration and Validation (DEM/VAL) and Qualification and Certification (QUAL/CER), require 36 months to complete. The remaining program will perform design optimization, produce prototype aircraft and flight test/FAA FAR 25 certify/qualify the MACHETE. The DEM/VAL and QUAL/CER phases consist of subphases as outlined:

- **Demonstration and Validation (DEM/VAL)**
  - **A) Design and Optimization**
  - **B) Simulation and Verification**
  - **C) Critical Design Review**
  - **D) Prototype and Systems Integration**
  - **E) Technical and Operational Evaluation**
- **Qualification and Certification (QUAL/CER)**
  - **A) Weapon System Evaluation**
  - **B) Type and Production Certification**



[redacted]

Upon completion of the R&D process, the MACHETE will enter Low Rate Initial Production (LRIP) at an appropriate, STAVATTI owned and operated facility. LRIP will result in the production of 25 aircraft, including 15 SM-27S and 10 SM-27T, built as Production Representative Articles (PRAs) and/or Production Representative Test Vehicles (PRTVs). Following LRIP, the MACHETE will enter Full Rate Production (FRP), resulting in the production of 50 aircraft annually, including 33 SM-27S and 17 SM-27T. It is anticipated that LRIP will begin in 2008, followed by full production beginning in 2009-2010, dependent upon ITM supply-chain/backlog and learning curve. STAVATTI anticipates that the MACHETE will remain in production through 2030, at such time the MACHETE program will be terminated. Prior to termination, STAVATTI will begin the process of developing a successor platform to the MACHETE.

IX. MACHETE PROGRAM PROCEDURE & APPROACH

The two final remaining phases that must be completed to finish the MACHETE RDT&E program, DEM/VAL and QUAL/CER, will be conducted as summarized:

DEMONSTRATION AND VALIDATION (DEM/VAL)

A) Design and Optimization (D&O)

MACHETE Design and Optimization (D&O) will require a total of six months. Concentrating on completing

[redacted]

STAVATTI is considering a variety of sites at which to establish the SM-27 development, LRIP and FRP facility and serve as the “HOME OF THE MACHETE” including the former Gulfstream Plant at PWA at Bethany, OK; the former Bell Plant/Wheatfield Business Park at IAG in Niagara Falls, NY; the former Piper Plant at LHV in Lock Haven, PA; the former AASI Plant at LGB in Long Beach, CA or a new build facility in New Mexico, Minnesota, Virginia, Montana, Kentucky or Texas. As a number of existing facilities,

[redacted]

therein permitting STAVATTI to afford both facility improvements while gaining real-estate equity. Facility ownership also enables STAVATTI to integrate critical production machinery and equipment, such as autoclaves, into a facility from which the equipment will not be moved for a number of years.

[redacted]

10 axis Cincinnati Milacron (enhanced Viper) fiber placement system for composite filament ‘lay-up,’ and associated/general machinery and equipment including engine carts, jigs, frames and support rigs, press-

[redacted]

components may be contracted to an existing qualified composites source.

[redacted]

MACHETE engineering, simulation and design. The SGI workstations will be equipped with Dassault Systems CATIA/CADM Version 5R13-15 through Version 6.0. Featuring FEA packages including ELFINI and CFD packages ranging from Paragon, CFD 2000, to CFD-FASTRAN, etc. During D&O STAVATTI will

[redacted]

models built will include an Aerodynamic Force and Moment Model and a Semispan Wing Reflection Model. A general description of the four models is as follows:

• Aerodynamic Force and Moment Model. A 1/13 scale (7.7%) sting suspension model to measure aerodynamic forces and their effects (including lift, drag, pitching moments, lift/drag ratios, etc.). This unit models the entire aircraft; from the tip of the aircraft nose to the end of the empennage Model features includes functioning ailerons, deflectable canard elevators, deflectable empennage slab, deflectable rudder and potential for deflectable TE flaps.

• Semispan Wing Reflection Model. A 1/6 scale (16.6%) model of the right MACHETE wing as measured from the aircraft centerline to wing tip. The model will incorporate the MACHETE wing for the purpose of evaluating and optimizing wing lift augmentation devices including leading edge slats, double slotted trailing edge flaps, etc. as well as the integration of wing mounted stores. Various combinations of flap configurations and corresponding double slotted flap and flap vane gap arrangements will be evaluated for the purpose of improved low speed handling characteristics. Alternatively, the model may not include the entire right half of the MACHETE fuselage from incorporating only the right wing semispan for the purpose of reducing model complexity. STAVATTI will explore these options pending further consideration.

[redacted]

Within the final month of D&O, STAVATTI will submit a Type Certificate Application to the appropriate FAA administrator for the design approval of the MACHETE as a new model aircraft. This application will result in the initiation of the FAA type certification process for the MACHETE through which the FAA will establish a Type Certification Project wherein the FAA AEG and Directorate/ACO assigns relevant chairman and project team members.

B) Simulation and Verification (S&V)

[redacted]

ty and control characteristics/parameters and the development of a database for specified regions of the aircraft flight envelope; the determination of aerodynamic loads/pressure distributions for the MACHETE; the determination of aerodynamic lift and drag measurements for performance prediction; the determination of stability and control data; determine external stores and alternate mission equipment carriage and separation throughout the service envelope; optimization of wing high lift device and control surface configurations; the generation of experimental data for flutter margin validation and the experimental study of various additional aspects of the MACHETE configuration.

[redacted]

This Mach number range will not only validate low speed characteristics, but provide both Never-Exceed-Speed testing and data points applicable to the further engineering of the turbofan SM-47. The test will be conducted over -20º to + 60º AoA. The program will consist of approximately 375 hours employing the aerodynamic force model and 125 hours employing the wing semispan reflection model. In addition, a stores, Captive Trajectory Technique may be employed to study the carriage and launch of AAMs and further stores. Stores to be analyzed include AIM-9, AGM-65, MK 82/84, GBU-31/32 JDAM and 100-230 US

gallon external tanks. The MACHETE will likewise be evaluated over various combinations of AoA, pitch and yaw consisting of $\alpha = 0^o$ to +/- 45º ,$\psi = 0^o$ to +/- 10º ,$\phi = 0^o$,180º .

All wind tunnel testing will be performed in test plan consisting of test blocks. Each test block may vary from between a total of 50 hours to 180 hours of testing. Each test block will evaluate a model over specific pause runs and model configuration/control surface deflection changes. Typically, all test blocks will consist of evaluation of specific wind tunnel models over a range of specified attitudes from $\alpha = 0^o$ to +/- 45º ,$\psi = 0^o$ to +/- 10º ,$\phi = 0^o$,180º as performed over specific control surface deflections. Furthermore, limited testing at alphas in excess of + 45º will be conducted to examine the high AoA regime. Each wind tunnel test block period will be separated by a two to four week data and test results analysis period, the results of which will directly influence the focus and scheduling of subsequent test blocks. The majority of wind tunnel testing will occur in 180 hour test runs. STAVATTI intends to conduct most MACHETE wind tunnel testing at Wichita State University (WSU), the transonic wind tunnels formerly known as Veridian/Calspan, NASA Glenn, NASA Langley, NASA Ames, as well as alternate NASA facilities.

The 500 hour test program is estimated to require a total of fourteen months. STAVATTI will conduct four months of testing, totalling over 180 hours, during S&V. The remainder of MACHETE wind tunnel testing will be performed concurrent to the critical design review and prototype construction. Wind Tunnel Analysis results will be used to optimize the MACHETE configuration and insure the functionality and success of core component features. The intricate design of aircraft components will be completed and the detail design of the aircraft within the final five months of S&V will result in the generation of final aircraft design files suitable for prototype fabrication. Concurrent to the initiation of S&V wind tunnel testing, STAVATTI will hold an FAA/STAVATTI familiarization/preliminary type certification board meeting. STAVATTI will provide the FAA with all necessary engineering and type data from which the FAA will develop a certification program plan and establish the aircraft certification basis.

Upon the successful completion of the initial wind tunnel test program as conducted in S&V, CATIA files of the aircraft detailing its conformal production configuration are prepared. Blueprints and CATIA files of the design are then released to the STAVATTI board of directors to conduct a Critical Design Review. Parallel to release of MACHETE design and engineering data to the board, STAVATTI will also submit the data to the FAA for approval and design evaluation.

C) Critical Design Review (CDR)

[redacted]

D) Prototype and Systems Integration (P&SI)

[redacted]

The production process will consist of alloy geodetic subframe component build-up and assembly, graphite/polyimide unibody and SPECTRA/polyimide exterior body panels and subsystem fabrication. STAVATTI will be responsible for the creation of all jigs, molds and tooling associated with prototype production. Approximately 70% of all alloy airframe components [redacted] from built-up assemblies created in house, while 30% of alloy airframe components [redacted] by qualified subcontractors including Universal Alloys, EG&G, DOW UT, IAI, EDO and Northrop Grumman.

Approximately 90% of graphite and aramid/polyimide along with additional composite components will be fabricated in-house by STAVATTI. The graphite structure makes substantial use of IM9 fiber by Hexcel Corporation and RP-46 polyimide resin as licensed produced by STAVATTI. AFR700B resin may be employed as an alternate composite structural matrix. To reduce prototyping costs, STAVATTI will create all initial prototype molds in-house using a resin billet and/or resin-foam-fiber method as employed by Lockheed Skunk Works™ in the prototyping of articles including the Tier III Minus Darkstar URA. The prototype molds will be suitable for 3 to 12 cycles, significantly reducing the cost of prototyping composite components. Note, however, that production MACHETE aircraft will utilize cast and plate Invar molds and tooling produced by Remmele Machining, Inc. for all composite component production. STAVATTI will be responsible for all composite filament placement, curing, etc. Approximately 10% of alternate composite and non-alloy components will be produced by subcontractors ranging from Norton and EDO Fiber Science to DOW UT.

Prototype fabrication will begin with the production of alloy aircraft components including geodetic subframe, spars, longerons, stringers and bulkheads from which the concurrent assembly of six core aircraft module systems will begin, including the fuselage, wing, right and left empennage and right and left canard. Each module will be independently assembled and completed. Upon completion of alloy airframe component assembly, all subsystems including electrical, hydraulic, landing gear and fuel stowage will be incorporated into each module.

STAVATTI will produce primary landing gear components including oleo and shock struts, although component brakes and wheels will be provided by BF Goodrich, Goodyear, etc. Production and FSD landing gear may be provided by Messier Dowty or Menasco, provided it is more efficient to add them as an ITM rather than produce said components in-house. STAVATTI will integrate all subsystem components produced and provided as complete units and/or LRUs by qualified subcontractors including powerplant, armament systems, radar and avionics, wheels and brakes, electronic countermeasures, ejection seat and pilot interface/control systems, flight control systems, air data and integrated electronic systems, birdstrike resistant canopy, hydraulic actuation and electrical systems, etc. STAVATTI will make substantial use of MOTS (Military Off-The-Shelf) and COTS (Commercial Off-The-Shelf) components. PAV-1 will, however, serve as a full system prototype, incorporating all prototype avionics including sensors. The MACHETE program will demonstrate full avionics integration within the PAV-1 and will not rely upon independent avionics ground prototypes or flying laboratories to demonstrate final avionics integration.

[redacted]

E) Technical and Operational Evaluation (T&OE AKA TOE)

[redacted] T&OE will focus on the initial flight testing of the MACHETE. The complete MACHETE flight test program will involve 1,500 hours over a period of 16 months. SM-27S MACHETE PAV-1 will experience a suitable limited access roll-out ceremony to commemorate the unveiling. Upon roll-out of the MACHETE prototype, STAVATTI will conduct static engine ground tests and evaluation at the prototype production/assembly facility. STAVATTI will perform a complete ground and preflight check of the aircraft. For flight test and precertification purposes, the MACHETE prototype will be issued an Experimental Airworthiness Certificate by the FAA, bearing an 'N' number as assigned by the administrator. Once the aircraft has complet-

[redacted]

The T&OE flight test program will evaluate nine principal test factors including Propulsion (emphasizing installed thrust measurement, inlet capability, engine stall margin, and self/airstart capability), Performance (emphasizing takeoff, climb, cruise, maneuvering, in-flight refueling, descent and landing), Flying Qualities (emphasizing stability and control characteristics, handling qualities characteristics, longitudinal and lateral directional maneuvers, stability derivative determination and frequency response analysis), Fuel Systems (emphasizing fuel containment, fuel supply systems, fuel system interface), Environmental Control Systems (emphasizing output air flow pressures, pressures, temperatures and characteristics), Landing Gear and Brakes (emphasizing wet and dry braking, short field braking and brake hold at maximum power), Aircraft Electrical and pneumatics/hydraulics (pneudraulics-emphasizing electrical generation and distribution, pneudraulic pressure and flow rates and alternate/back-up electrical and pneudraulic systems), Human Factors (emphasizing man/machine interfaces), Flight Controls (emphasizing mechanical characteristics, electronic characteristics, control systems authority, man/machine compatibility and aircraft flight control effectiveness) and Structural Dynamics and Flutter (emphasizing aircraft flight loads and real time in-flight flutter analysis).

The T&OE flight test is considered a manufacturer's flight test and will be conducted by STAVATTI. The purpose of T&OE is to ensure that the MACHETE is a functional aircraft. This evaluation consists largely of flight testing from the standpoint of system operability and dynamics. STAVATTI is responsible for the flight test and system evaluation of the PAV-1 aircraft within this subphase. T&OE flight testing will consist of approximately eighteen flights per month, with each flight having an average duration of two hours, throughout the four month T&OE period. The T&OE fight test program will result in a total of 72 flights and a total of 144 flight hours. Initial flight test operations will begin with a series of low and high speed taxi tests to evaluate nosewheel steering, braking and longitudinal control ability. During preflight and taxi tests the flight test instrumentation system will be thoroughly checked to ensure functionality. First flight of the PAV-1 will likely consist of a two aircraft team including the PAV-1 and an assigned chase plane. The PAV-1 will evaluate aircraft handling, engine transient, cruise entry performance and high gain flight qualities. First flight will be restricted to a maximum altitude of 5,000 ft, a maximum airspeed of 250 kts, a maximum load factor of four Gs, a maximum AoA of 15º , landing gear retraction and a duration of seventy five minutes. Following first flight and data analysis, the next five subsequent flight tests will serve to confirm MACHETE airworthiness and clear the aircraft for its basic flight envelope. Initial testing will focus upon flying qualities, performance, engine and systems operation, low speed handling and maneuverability and extension of flutter envelope clearance. In-flight engine shutdown and restart will be simulated within the first five flights. By flight 25, the PAV-1 will be cleared for stalls, slips and spins and a +7/-3 load limit envelope. Completed T&OE flight testing will result in the clearance of the PAV-1 for a demonstration flight envelope over +7/-3 Gs, 60 KCAS to 420 KCAs and flight altitudes to 35,000 feet.

[redacted]

due to availability of prototype tooling). PAV-2 and PAV-3 will be built from conformal production tooling and jigs and will be essentially production grade articles. PAV-2 and PAV-3 construction will require the full four months of T&OE, as well as the first two months of the Qualification and Certification phase. PAV-2 will be a prototype of the two place tandem SM-27T, while PAV-3 will be a second SM-27S aircraft. A [redacted]

During T&OE, STAVATTI will continue wind tunnel analysis of the MACHETE, concentrating upon envelope expansion and captive stores separation and trajectory analysis. All stores systems, including AGM-65, AIM-9, GBU-32, etc. which will be qualified for weapon system delivery during WSE will be evaluated during the captive stores separation simulation. This wind tunnel test program will span the full four months of T&OE. The completion of T&OE will also mark the completion of the MACHETE wind tunnel test program with the accumulation of some 500 hours. Note that the MACHETE wind tunnel test program is stretched over an eighteen month period such that STAVATTI has adequate time to investigate specific aerodynamic characteristics of the MACHETE throughout the development program.

At the conclusion of T&OE STAVATTI will analyze and review flight and ground test results and clear the aircraft for Qualification and Certification. Total accumulated flight time on PAV-1 will be 72 flights and 144 hours at the conclusion of T&OE. T&OE represents the final aspect of the twenty four month DEM/VAL phase.

QUALIFICATION AND CERTIFICATION (QUAL/CER)

A) Weapon System Evaluation (WSE)

MACHETE Weapon System Evaluation (WSE) will require a total of six months. WSE will build upon the flight testing initiated in T&OE. The purpose of WSE is to demonstrate the MACHETE‘s effectiveness as a Weapon System. WSE concentrates heavily upon manufacturer flight testing for both FAA conformity and MIL SPEC qualification. The WSE test program will continue to evaluate the nine principal test factors explored in T&O with the addition of seven further test factors including Weapon Delivery (emphasizing air-to-air and air-to-ground gunnery, air-to-air and air-to-ground missile launch, air-to-ground bombing including separation and accuracy, stores management systems and gun harmonization and boresight), Avionics Integration (emphasizing radar, navigational, threat warning, electro-optical, electronic warfare including electronic countermeasures, electronic counter-countermeasures and C4I, altimeters, communication, and antennal patterns including IFF, secure/non-secure com, displays, computer systems and FLIR/Laser designation), Weather/Climatic (emphasizing arctic weather, tropical weather, hot desert weather, hydroplaning and wet runway operation, powerplant water ingestion and in-flight icing), Reliability and Maintainability (emphasizing LRU exchange, powerplant removal/replacement, consumables replenishment, structural damage repair and forward operability) and Emergency Egress (emphasizing pilot ejection).

To conduct WSE, it is assumed for the purposes of program planning that the MACHETE Flight Test Program will be conducted at the Air Force Flight Test Center (AFFTC) at Edwards AFB. In the circumstance it becomes evident during DEM/VAL that the USN or USMC is more proactive with regard to MACHETE qualification, flight testing may be conducted at PAX RIVER instead of the AFFTC. In either case, STAVATTI may commercially contract the AFFTC or PAX RIVER in support of MACHETE flight test or conduct flight testing through a DoD contract in support of potential DoD acquisition of MACHETE aircraft.

Alternatively, MACHETE flight test may be conducted at commercial flight test ranges in Mojave (MHV), California or at a STAVATTI established flight test center in New Mexico; possibly Alamogordo (ALM). Prior to relocation of flight test operations, STAVATTI will assign additional personnel to the MACHETE program, raising the total number of salaried personnel working on the project to between 80 and 100. Total MACHETE program staff at this time will range between 90 and 120 persons. This level of personnel will remain constant until the MACHETE enters LRIP.

STAVATTI will apply the telemetric, logistical and flight test operations/management services as offered commercially to qualified defense contractors by the AFFTC. Flight operations will occur throughout R2508. Working with the AFFTC Single-Face-To-Customer (SFTC) office and the FAA, STAVATTI will design and implement an approved manufacturer's flight test program. Upon arrival at the AFFTC, STAVATTI will install all aircraft flight test instrumentation. PAV-1 flight instrumentation is centralized about an Instrumentation Data Acquisition Package (IDAP) mounted within the cargo compartment within the aircraft nose. The IDAP contains a high speed data recorder to retain all flight data as derived from over fifty remote units placed throughout the aircraft. The IDAP will remain within the aircraft throughout the test program and will provide encrypted, real time data to ground mission control stations for concurrent processing. STAVATTI will employ a common AFFTC/contractor test correlation software program[16] to maximize data collection. Use of flight test software will benefit daily flight test data management and the ability of flight test engineers to concurrently test multiple aircraft flight characteristics simultaneously or within the same sortie.

During the first month of WSE, PAV-1 will be subjected to ground based avionics integration, and system evaluation. The ground based testing will focus upon use of several AFFTC facilities and complexes including the Integration Facility for Avionics Systems Testing (IFAST-used to evaluate hardware/software interactions with MACHETE avionics suites and weapon/sensor systems), the Air Force Electronic Warfare Evaluation Simulator and the Digital Integrated Air Defense System (AFEWES and DIADS-used to evaluate electronic combat systems performance and C4I, IADS simulation in a high density environment), the Avionics Test and Integration Complex and Test and Evaluation Mission Simulator (ATIC and TEMS for use in aerospace vehicle M&S testing and test crew training), the Weight and Balance Facility (Bldg 1830-used for initial and qualification/certification weight and balance measurement), the Ground Vibration Test Facility (used for vibration testing of the total MACHETE aircraft with and without external stores/suspension equipment) the Aircraft Gun Harmonization Facility (used for live fire checkout, HUD symbology alignment and bore sighting) and the Munitions/Missile Complex (used for integration of munitions including missile and pylon analysis and carrier aircraft interface). Use of these facilities and services will be aggressive and fast paced with a focus upon validation of aircraft systems, performance and operability rather than exploration of new technologies. The test will ensure that the aircraft is a functional weapon system prior to live fire testing and range qualification.

Following the one month of ground testing, PAV-1 will begin flight testing at the AFFTC, consisting of a complete envelope exploration of the MACHETE. The prototypes will undergo full spin-testing and demonstrate their ability to perform standard combat maneuvers as well as 'snap-rolls,' 'hammerhead stalls,' and a compliment of competition grade aerobatic maneuvers, including full exploration of aircraft departure characteristics, particularly in the low-speed/high AoA and Stall/Spin realms. PAV-1 will also undergo the live firing of unarmed and armed (4) AIM-9, (6) AGM-65, (2) AGM-88, (4) GBU-24, (2) GBU-32 and (2) GBU-31 munitions at the Precision Impact Range Area (PIRA) and the Naval Weapons Center at China Lake. Additional non-precision stores and stores launch/dispenser systems will also be tested including Mk. 82 GPB, Mk. 83 GPB, BLU-107 Durandal, LAU-3 rocket pod, Rockeye II CBU, SUU-11 (GAU-2) Gun Pod, and various Napalm and Cluster Bombs. Non-destructive stores integration testing, including Machete integration and carriage of various Sergent Fletcher external fuel tanks (100 USG, 150 USG and 230 USG) and the ALQ184(V) ECM pod will also be conducted. Additional stores may also be evaluated. WSE will clear the MACHETE platform for the carriage and delivery of external stores.

In addition to the flight test program at the AFFTC or alternate facility, STAVATTI will initiate MACHETE VSS static and ground testing at the prototype/production facility at the start of WSE. STAVATTI will employ VSS-1 and VSS-2 to evaluate airframe structural integrity on the ground. Both VSS-1 and 2 will remain at the production site for ground simulation on STAVATTI maintained rigs. VSS-1 will be employed throughout the WSE flight test program for flutter excitation to ensure that the aircraft is free from flutter and structurally stable throughout the flight envelope prior to expanding the flutter envelope on PAV-1. VSS-1 will be placed within a load simulation cell and stressed to simulated air loads. This process will ultimately permit the calibration of strain gauges with known loads for accurate load data gathering on PAV-1. VSS-2 will be employed to explore structural dynamic conditions including vibration tests and dynamic load simulation. VSS-2 will be placed into a static testing fixture, allowing loads to be applied to various parts of the airplane at varying degrees to test its structural strength under highly controlled and tightly monitored conditions to simulate loads experienced in actual flight. Employing a 'stepping up' process, VSS-2 will be placed to the design limit and later the ultimate test of the structure to 150 percent of

the load limit, clearing the PAV-1 to demonstrate maximum flight loads. Operating 24 hours per day, VSS-2 will be subjected to intense fatigue testing, loaded over numerous cycles to simulate multiple aircraft life-times. Ground testing of VSS-1 and VSS-2 will occur throughout WSE and will be extended throughout the lifetime of the MACHETE program into LRIP and FRP.

ABOVE: SM-27T MACHETE™ IN HYPOTHETICAL USAF LIVERY

Including VSS load simulation, subscale and full scale article testing will be conducted on airframe components including coupon tests of MACHETE airframe materials such as IM9/RP-46, IM9/AFR 700B, IM8/RP-46 etc, including durability and damage tolerance tests, including static tests on all titanium, stainless steel and aluminum materials. Static testing of specific materials testing will occur at non-STAVATTI facilities including NASA Langley and Science and Technology Corporation (STC). STAVATTI will conduct in-house integrated avionics and flight control law testing concurrently with flight testing using both AFFTC and production facility based STAVATTI systems. To ensure ejection seat compatibility, STAVATTI will fabricate a cockpit/forward nose section for the purpose of emergency egress evaluation at the USAF Multi-Axis Seat Ejection Rocket Sled Facility at Holloman AFB, Alamogordo, NM. Sled testing will occur within the final two months of WSE. Throughout WSE STAVATTI will conduct a widespread MACHETE marketing campaign to incite customer interest in the program and begin ordering MACHETE production components that require 12 month lead times (powerplant, radar, etc.) in preparation for LRIP.

[redacted]

facility designated test region. Initial performance of PAV-2 and PAV-3 will be compared to that of PAV-1 for calibration purposes. Following the award of Experimental air worthiness certificates to PAV-2 and PAV-3, PAV-2 and PAV-3 will join PAV-1 at Edwards AFB for WSE flight testing.

During WSE, PAV-1 will fly for approximately five months. PAV-2 and PAV-3 will fly for approximately four months. All three MACHETE prototypes will conduct approximately eighteen flights per month, each flight having a duration of two hours. Total PAV-1 flight time during WSE will be approximately 180 flight test hours. Total PAV-2 flight time during WSE will be approximately 144 hours. Total PAV-3 flight time during WSE will be approximately 144 hours. Total accumulated MACHETE flight time during WSE will be approximately 234 flights and 468 hours. Upon conclusion of WSE, STAVATTI will submit flight test results, considered manufacturer's flight test results, to the FAA for review. WSE will clear the MACHETE for specific stores carriage and delivery and qualify the MACHETE as a weapon system. Total MACHETE flight time resulting from all flight testing (including T&OE) will be approximately 306 flights and 612 hours by the conclusion of WSE.

B) Type and Production Certification (T&PC)

[redacted]

trates upon achieving FAA airworthiness certificate award for all three PAVs as well as the FAA Type and Production certification (and MIL-SPEC qualification) for the MACHETE platform/all subsequent MACHETEs to be produced. MACHETE Type and Production certification will be sought under FAR 25. At the start of T&PC, the FAA will review STAVATTI flight test information as provided at the close of WSE. As all flight testing during WSE will be monitored, if not conducted, by FAA Designated Engineering Representatives (DERs), STAVATTI flight test data will likely credit directly toward FAA certification. Based upon the review, the FAA will issue a TIA and perform a Conformity Inspection. At the conclusion of the conformity inspection, the FAA will begin Official Flight Certification Flight Tests and Flight Standards Evaluations. All FAA testing will occur at the AFFTC.

[redacted]

tion of two hours per flight. Combined PAV-1, PAV-2 and PAV-3 testing will result in 324 flights and 648 flight hours during T&PC.

At conclusion of FAA flight testing, the FAA will perform Functional and Reliability testing of the MACHETE and approve both the MACHETE flight manual, TC data sheet and hold a final Type Certification Board meeting. Upon conclusion of the board meeting, the AEG will complete continuing airworthiness determination. Throughout the test process, STAVATTI will continue to simulate aircraft flight loads, 24 hours per day using the VSSs based at the production site (Home). At the conclusion of T&PC VSS-2 will have achieved over 8,400 hours of simulated flight operation, nearly equivalent to one half of the MACHETE design life. Similarly, aircraft structural samples and swatches will be thoroughly analyzed and subjected to life cycle wear.

Concurrent to FAA flight test and evaluation, STAVATTI will prepare the production facility to begin LRIP. This preparation will include the fabrication of MACHETE production grade tooling and jigs, incorporating any changes as necessitated by prototype article review. At the beginning of T&PC STAVATTI will order the design and fabrication of final, production grade cast and plate Invar molds for large composite components from Remmele Engineering, Inc. All prototype tooling deemed acceptable for production operations will be moved directly into the production area with the entire prototype line being converted and expanded to function in a production mode. STAVATTI will acquire and set-up any and all additional machinery and equipment as necessary to conduct MACHETE production. STAVATTI will perform all necessary pre-certification work to achieve a production certificate at the production facility concurrent with type certification. During T&PC STAVATTI will continue to conduct a widespread MACHETE marketing campaign to incite customer interest in the program.

Throughout FAA participation in T&PC, STAVTTI will continue to employ the commercial services of AFFTC qualification personnel to further validate the MACHETE as a weapon system. A fundamental component of the T&PC testing performed by the AFFTC is the Logistics Test. The Logistics Test is a process which determines the supportability and maintainability of an aircraft and weapon system throughout its operational lifetime. The test will focus upon the analysis of ten Integrated Logistics Support (ILS) elements. The elements evaluated are supply support; technical data; packaging, handling, storage and transportation; computer resources; maintenance planning; support equipment; manpower & personnel; facilities; training & training support and design interface. The results of the Logistics Testing will be the

improvement and qualification of the design to insure that the weapon system is a best value from a logistics and operability standpoint for decision makers engrossed in long-range planing.

Once the AEG has completed continuing airworthiness determination, the FAA will issue the MACHETE a type certificate with all three PAVs receiving a standard air worthiness certificate, supplanting their previous Experimental status. Following type certification, anticipated in the sixth month of T&PC, STAVATTI will continue MACHETE flight tests to achieve AEG operational acceptability, while emphasis turns to the certification of the MACHETE production line in the home facility. STAVATTI intends to achieve a MACHETE Production Certificate by the conclusion of T&PC. Award of both Type and Production Certificates will result in the conclusion of Qualification and Certification and the initiation of the MACHETE into revenue service, beginning with Low Rate Initial Production (LRIP). Total accumulated MACHETE flight time at the conclusion of T&PC will be approximately 750 flights and 1,500 hours.

X. MACHETE PROGRAM DURATION

[redacted]

XI. MACHETE LRIP

[redacted]

projected to begin in 2008-2010.

LRIP consists of a one year gradual ramp-up of production, focused upon the manufacture of 15 SM-27S and 10 SM-27T MACHETE Production Representative aircraft. All aircraft produced during LRIP are considered Production Articles. The first two to six MACHETEs produced will likely remain in possession of STAVATTI to serve as company demonstrators. The remaining MACHETEs produced during LRIP will be delivered to satisfy initial customer orders. It is likely that STAVATTI will have a backlog for MACHETE orders. STAVATTI will begin satisfying this backlog through LRIP. LRIP is scheduled to begin in 2005.

[redacted]

XII. MACHETE FRP

The MACHETE will enter Full Rate Production (FRP) in 2009-2011 following LRIP. FRP will result in the manufacture of up to 50 aircraft per year based upon customer demand. STAVATTI will establish one production line which will handle the production of up to 25 aircraft per year, with two lines established at the production facility, operating in parallel, to produce 50 annually. Production is anticipated to consist of 33 SM-27S and 17 SM-27T annually, although actual production volume will depend upon customer demand. Each aircraft will require approximately 1.6 to 3.2 weeks to produce, based upon customer selected aircraft configuration. STAVATTI projects an 80% learning curve on the first 100 to 150 aircraft with a 75% learning curve on aircraft produced through 250 units.

Provided STAVATTI pursues the development and production of the SLEEK series of high performance

sportplanes, it is likely that the MACHETE and SLEEK will be produced on neighboring lines to benefit from overall aircraft commonality. As the SLEEK is a “demilitarized” SLEEK, it is estimated that approximately 60% of the aircraft structure is identical, requiring identical tooling, jigs and molds for production.

STAVATTI anticipates the employment of approximately 200 to 250 aerospace machinists and assembly

[redacted]

STAVATTI production projections are based upon peace-time conditions. In the event of protracted conventional wars and counter-insurgency actions, STAVATTI anticipates that MACHETE production may be increased to as many as 125 aircraft annually. Such production increases will not result in any significant alternation to the production line, but rather the addition of production lines to address demand.

Throughout FRP, STAVATTI will continue flight testing the three PAVs and up to six demonstrator aircraft, as well as continue a full simulated lifetime cycle test using the VSS.

MACHETE production will likely continue for a period of twenty to thirty years. STAVATTI anticipates that the MACHETE production line will close after 2030. Total anticipated MACHETE production is estimated at a total of 900 and 1,800 aircraft.

XIII. MACHETE FLYAWAY COST

The Per Unit Flyaway Cost of the SM-27S MACHETE as offered through the Standard Weapon System Configuration (SWSC) is approximately $6.1 million to $9.5 million, with an average unit cost of $7.6 to $8.2 million in US funds for both US domestic and foreign export customers. Flyaway cost for the two place SM-27T MACHETE is approximately $6.6 million to $10.3 million, with an average unit cost of $8.2 to $8.6 million in US funds for both US domestic and foreign export customers. The mean flyaway cost of

[redacted]

Actual unit flyaway cost of the SM-27 is highly dependent upon customer selected avionics, electronic warfare and fixed armament systems configurations. STAVATTI enables the customer to choose from a wide variety of aircraft configurations, hence cost varies from customer to customer, aircraft to aircraft. Total procurement cost is also dependent upon the costs associated with both STAVATTI and third-party provided support equipment, such as spares, ground handling equipment and ordinance/stores/pods.

All sales will be performed as Firm, Fixed-Cost Contracts. STAVATTI prefers to accept payment by cash, wire transfer or certified check, with payment terms of 50% upon order and 50% upon delivery. All funds must be in US Dollars (USD), gold, sliver, or platinum group metal or alternate offset as negotiated (coal, oil, precious gems, etc.). The procurement of aircraft may also be financed via a designated STAVATTI financing partner or subsidiary.

STAVTTI will perform at minimum, a 5 hour flight test of each MACHETE aircraft prior to customer turnover. STAVATTI can provide aircraft delivery services or customers may provide product-to-end-user destination transport. All aircraft delivered will be accompanied by a 2,000 hour ‘Nose-to-Nozzle’ Manufacturers Limited Warranty on all material and workmanship. All MACHETE contracts will contain a said number of production MACHETE aircraft as well as weapon system operation and service instruction and training equipment, contractor technical and logistics personnel services, associated support equipment, flight test instrumentation, software development integration, spares and repair parts, publications and technical documentation, and other related requirements to ensure total system supportability.

MACHETE aircraft may also be leased from STAVATTI, or sold via FMS through a US service branch arm. STAVATTI may also provide total Tactical Air Operations packages (TACAIRO) including aircraft, aircraft operator and aircraft support material, contracted on a quarterly or annual basis on either a lead/wingman, squadron or wing level. In so doing, STAVATTI can work directly with, or as an alternative to, successful turnkey services providers such as Dyncorp, now owned by Computer Sciences Corporation.

XIV. MACHETE PROGRAM COST & EXPENDITURES

[redacted]

Employing a Management, Engineering, Prototype Production and Flight Test/Evaluation “Tiger Team” consisting of [redacted] later program senior level staff and advanced development engineers, STAVATTI anticipates the SM-27 RDT&E program will result in approximately 500 hours of wind tunnel testing with 6 models; 2 SM-27S Prototype Air Vehicles (PAVs); 1 SM-27T PAV; 1 SM-27 VSS ‘Iron Bird,’; 1 SM-27 series Full Motion-Full Mission Simulator; up to 1,500 hours of flight testing and qualification at the AFFTC (note that flight test is carried beyond RDT&E into LRIP years) including stores qualification testing; SM-27 avionics, powerplant and armament bench test sets; SM-27 production tooling and manufacturing equipment; a 150,000 sq ft SM-27 production facility; advanced computational tools; salaries, wages and benefits; general operating and administrative costs. These costs indicate only RDT&E costs as well ast the costs for LRIP production tooling and manufacturing equipment.

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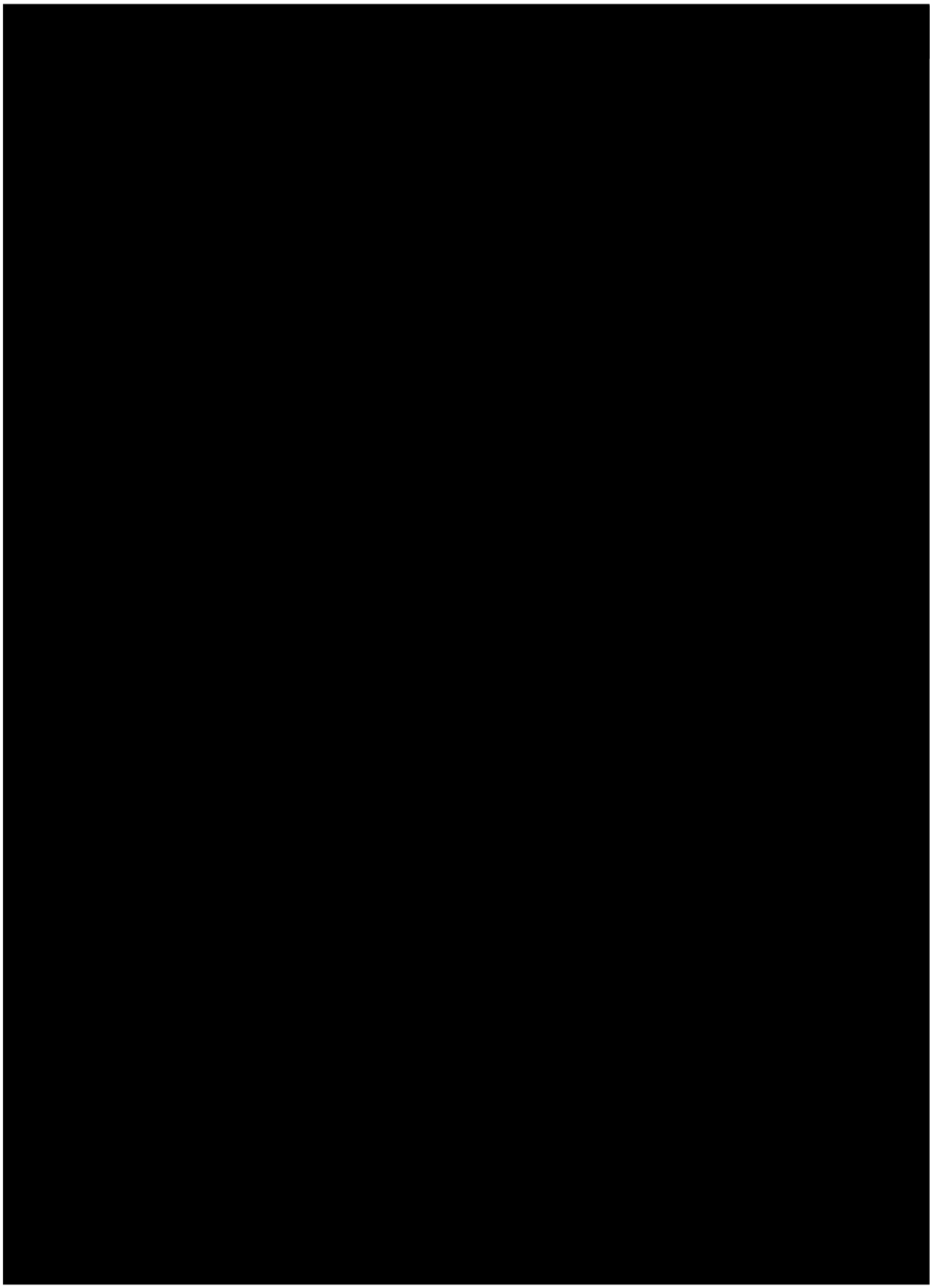
[redacted]

[redacted]



XV. MACHETE PROGRAM MANAGEMENT & EMPLOYMENT

[redacted]

development program is reminiscent of the North American P-51 Mustang and Lockheed F-80 Shooting Star development programs which were completed, start to finish, in 117 days and 180 days respectively. Employing a commercial, lean aerospace, flexible manufacturing approach, STAVATTI anticipates a greater learning curve and cost savings than that associated with the highly successful F-117 program.

STAVATTI is led by Chairman and CEO, Christopher R. Beskar. Mr. Beskar is STAVATTI's Strategic Leader and Chief Designer. Serving as Program Manager for the F-26 STALMA, MACHETE and all STAVATI Special Access programs for user agencies, Mr. Beskar is an authority on achieving air warfare mission success and founded STAVATTI in 1994 and STAVATTI HEAVY INDUSTRIES, LTD. in 2005.

STAVATTI's executive hierarchy also includes a nine member Board of Directors (Including Wendell Maddox, Dr. Adarsh Deepak, Kevin Burns and Dr. Robert C. Sugarman), COO Santiago S. Navarro, Corporate Secretary (Jeffrey A. Gongoll) and CIO. Modeled after the incredibly successful Lockheed Martin Skunk Works®, the STAVATTI leadership structure is organized for minimum bureaucracy.

Focused upon meeting the demands of the military customer, STAVATTI is driven through successfully addressing valid defense needs. Working in association with extremely talented aerospace "generalists", STAVATTI will employ scientists, engineers and program managers previously associated with Lockheed Martin, Boeing, and Northrop Grumman whose expertise resulted in the creation of most of the "teen fighters" as well as F-117, B-2, YF-22 and YF-23 throughout the SM-27 program, including associates from/with the CIA/NSA/UNCLE and the USAF NAIC. An extremely exciting program, STAVATTI predicts no difficulty in peppering the development and production team with extraordinary talent and ability once RDT&E enters the DEM/VAL phase.

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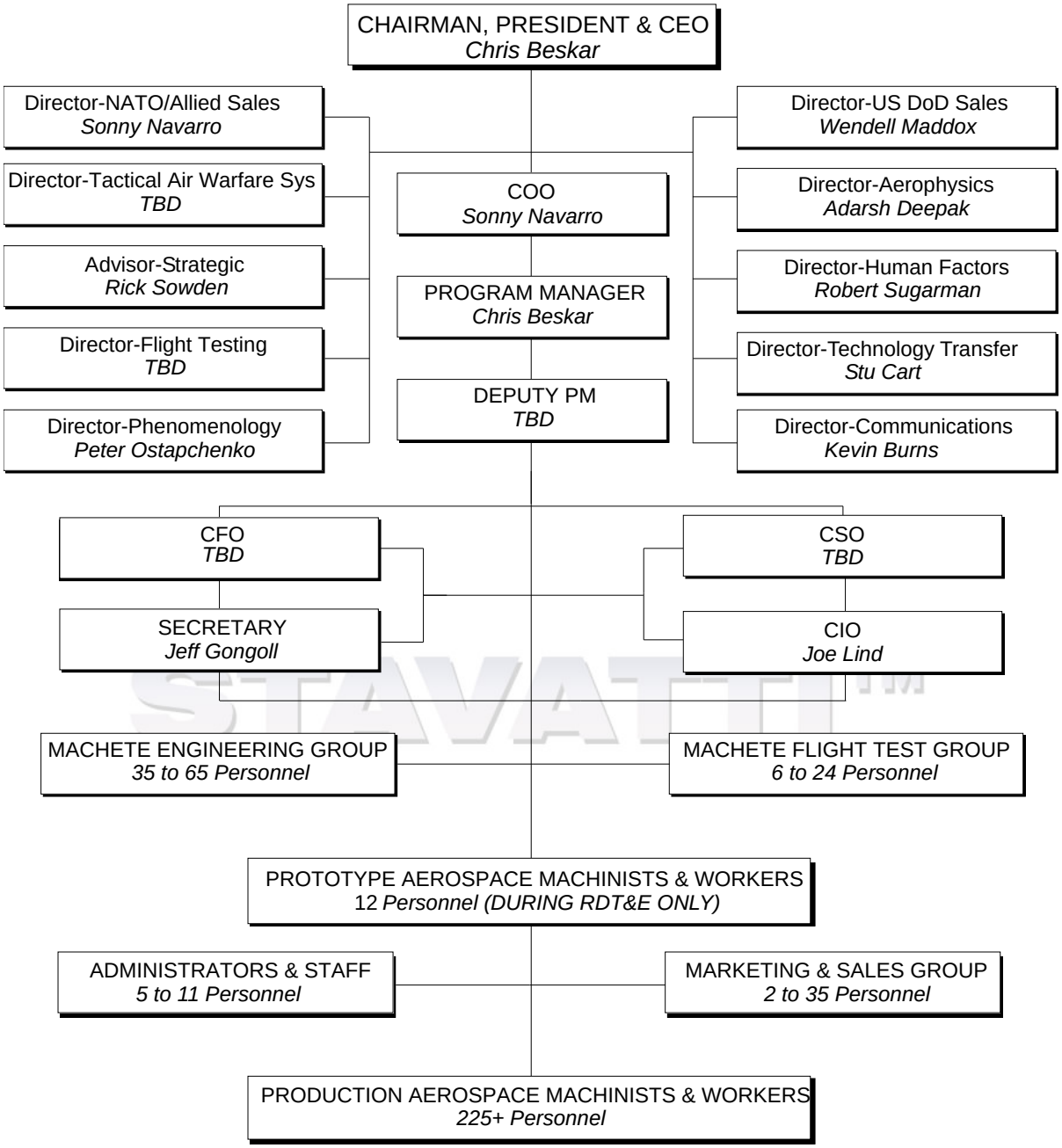
SM-27 MACHETE™ PROGRAM TEAM ORGANIZATION



The STAVATTI MACHETE PROGRAM TEAM ORGANIZATION (PTO) CHART provides insights into the basic organization and chain-of-command associated with the MACHETE Program Team from initiation of RDT&E and as we head toward LRIP and later the Full Rate Production level, including the employment of 225 aerospace machinists and assembly persons. At FRP, STAVATTI's MACHETE program will be producing about 50 aircraft annually and employing over 305 persons.

The MACHETE Program Team uses an organizational approach that emphasizes growth and individual leadership. Concentrating upon a leadership driven methodology, the STAVATTI APPROACH (as detailed in the monograph **The Stavatti Approach to Aircraft Development, Production and Support SD-87432-M**) employed throughout MACHETE RDT&E emphasizes a delegation of responsibility onto

the individual, whereby all project engineers are fully responsible for all decisions relating to the program in-whole (including design, prototype, production engineering, cost and material handing) subject only to the next higher authority. The program team is lead by a very strong and decisive Program Manager who serves as a hands-on, benevolent dictator. Responsible for orchestrating the design, development and production of the aircraft, the Program Manager is responsible for ensuring that all associated RDT&E personnel are granted the authority to execute their own personal skills and talents in a manner which permits them to achieve the best results possible.

Individuals employed on the program team are of significant talent and ability. Rather than employ an excessive number of average to mediocre engineers, STAVATTI maintains extremely high standards, drawing and accepting only those individuals of exceptional ability and skill. These individuals are generalists who are fully capable of satisfying any multitude of roles as may be demanded including being not only an engineer, but drafter, prototyper, fabricator, evaluator, receptionist, salesman and data analyst in the case of engineering team members. In so doing, a tightly-knit group of senior personnel is integrated into an organization which has a single goal in-mind: produce a fantastic airplane on-time.

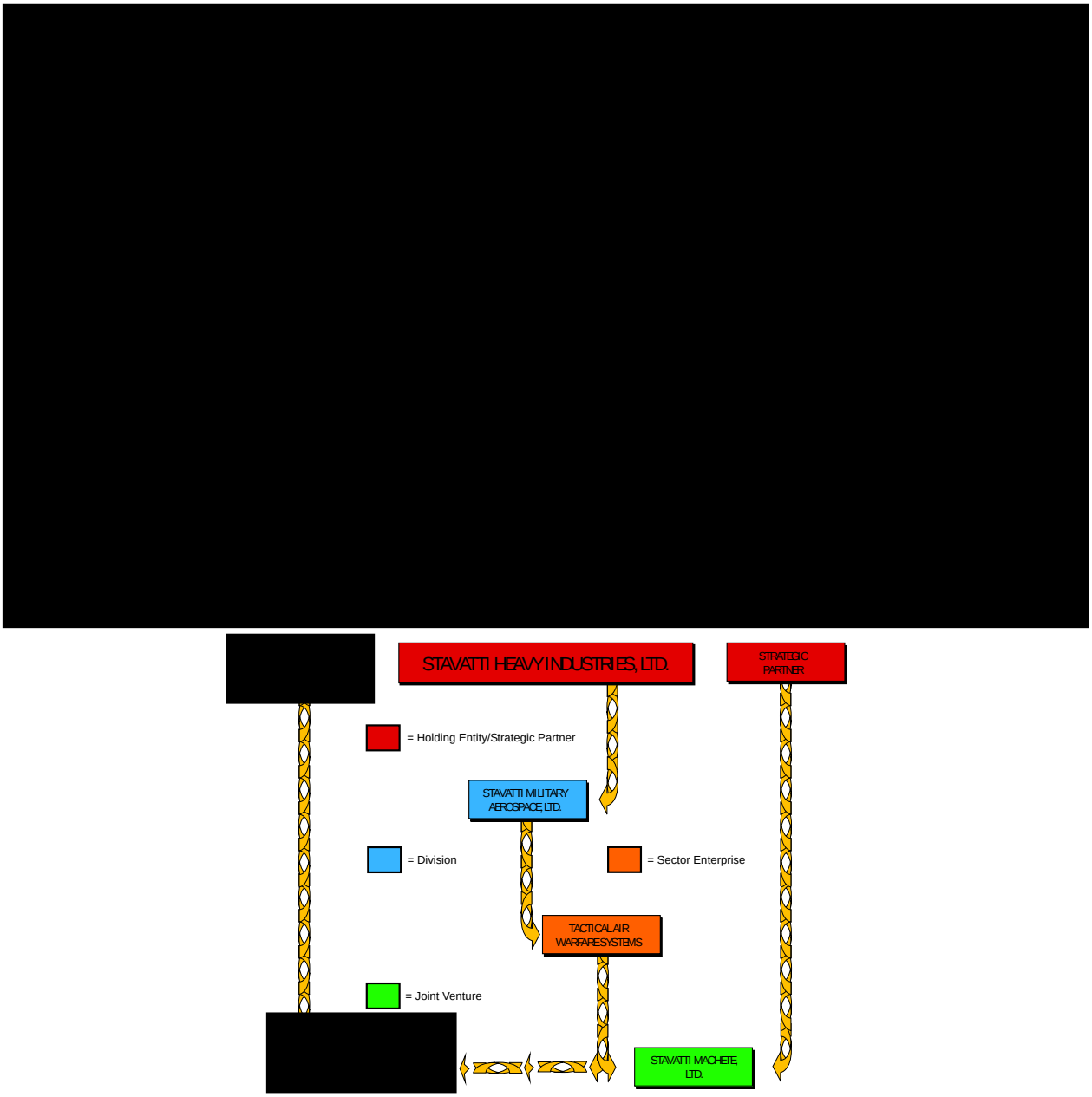
TABLE 10.0: SM-27 MACHETE™ PROGRAM TEAM EMPLOYMENT

PROGRAM PHASE	**LRIP**	**FRP**
Management Group	12	12
Engineering Group	24	24
Flight Test Group	8	8
Administrations Group	11	11
Marketing & Sales Group	35	35
TOTAL SALARIED PERSONNEL	**90**	**90**
Machinists & Assembly Workers	114	227
TOTAL PERSONNEL	**204**	**317**

XVI. MACHETE CORPORATE ENTERPRISE

The MACHETE is a program of the Tactical Air Warfare Systems Division of STAVATTI. STAVATTI is an Aerospace Defense Prime Contractor responsible for performing the design, qualification, production, distribution, service and total system support of manned aerospace vehicles. Focused on the development and manufacture of fixed wing, military and general aviation aircraft, STAVATTI's core competency rests with advanced fighter production. A privately held, American corporation, STAVATTI is one of few remaining domestic defense prime contractors able to produce military qualified, generation next aircraft.

Established in 1994, STAVATTI's focus has rested upon the commercial development of advanced combat aircraft for Direct Commercial Sales to US and NATO air forces, as well as the non-commercial development of special access aerospace platforms for government user agencies. Currently headquartered in Minnesota with offices in New York and Idaho, STAVATTI is a C corporation. Applying a commercial approach to the business of aerospace defense, STAVATTI combines lean practices with proven Skunk Works® style management techniques to return profitability to military aircraft production.



XVII. MACHETE FINANCIAL & PRODUCTION PROJECTIONS

[redacted]

TABLE 12.0: SM-27 MACHETE™ PRODUCTION FORECASTS

YEAR	SM-27S PRODUCTION	SM-27T PRODUCTION	TOTAL SM-27 PRODUCTION
2005*	[redacted]		
2006*			
2007*			
2008**			
2009			
2010			
2011	33	17	50
2012	33	17	50
2013	33	17	50
2015	33	17	50
2020	33	17	50
2025	33	17	50
2030	33	17	50

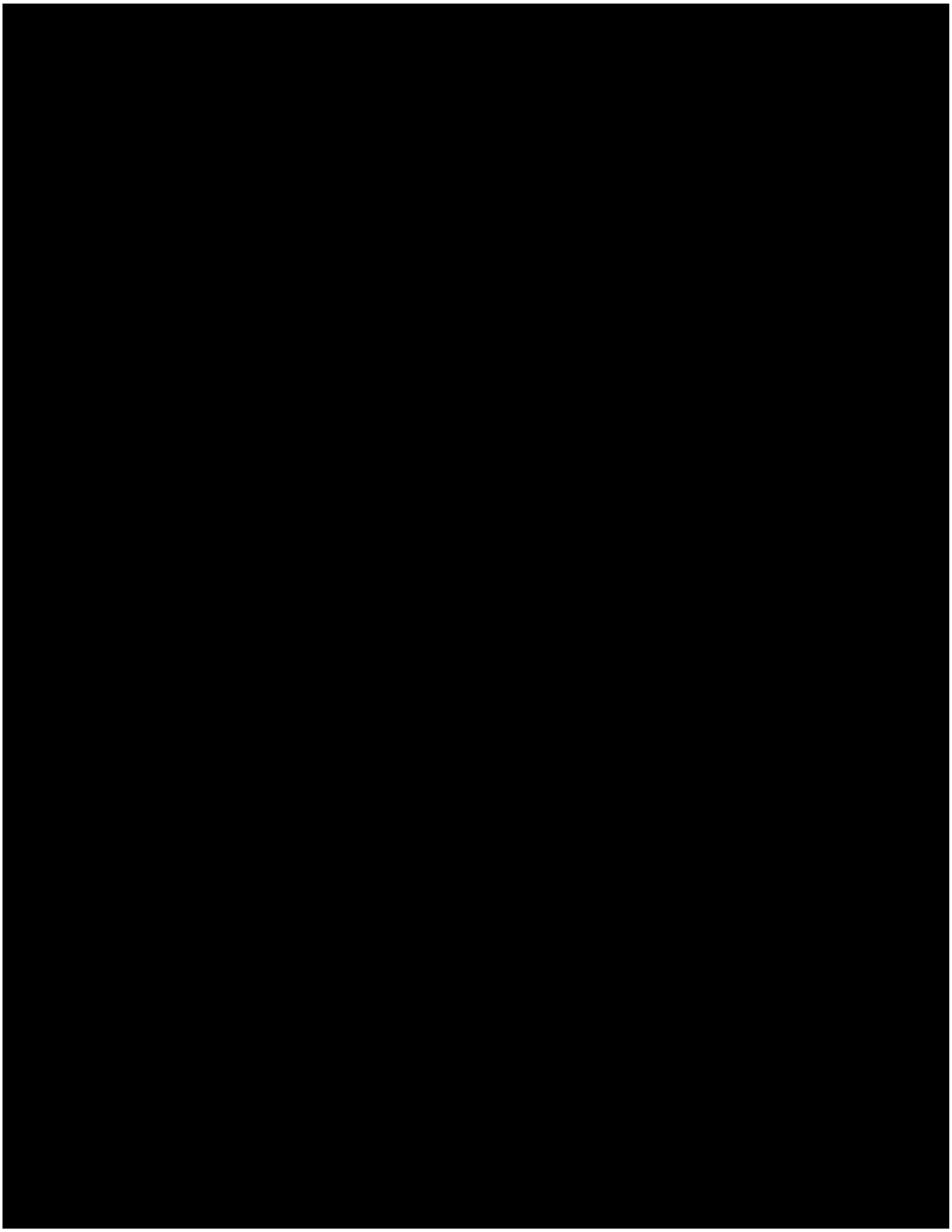
*PAVs or PRTVs. ** LRIP Aircraft

TABLE 13.0: SM-27 MACHETE™ LABOR FORECASTS

YEAR	ASSEMBLY	SALARIED	TOTAL
2005*	[redacted]		
2006*			
2007*			
2008**			
2009			
2010	227	90	317
2011	227	90	317
2012	227	90	317
2013	227	90	317
2015	227	90	317
2020	227	90	317
2025	227	90	317
2030	227	90	317

Note: *Labor Forecasts assume total production of only 900 SM-27s. Total SM-27 production may exceed 1,500 units, carrying production and employment through 2040 at the 2009-2030 level.*

XVIII. MACHETE COMMERCIAL BENEFIT, INVESTOR PARTICIPATION AND ROI



XIX. MACHETE PROGRAM SUPPORT OF THE DoD MISSION

When STAVATTI initiated the MACHETE program in October 2000, the aircraft was being developed specifically to assist in fighting entrenched fundamentalist terrorists, located in the Pacific Rim and worldwide. These terrorists are integrally linked to terrorist groups worldwide and have both sophisticated equipment and decades of insurgent experience. The terrorists of the Philippines, Indonesia, etc. were in fact former members of the Mojahedin and directly linked to fundamentalists in Afghanistan.

Today the United States is engaged in a war against terror. Today the Iraqi resistance fighters are known among the Iraqi people as the Mojahedin[18]. This war has focused upon combating terrorists in Afghanistan, the Philippines, In Africa, In Iraq and potentially, in Iran, Syria and a host of totalitarian threat nations. The MACHETE is designed to combat these terrorists. Unlike attack helicopters and fast jets, the MACHETE has the proper balance of speed, climb-rate, maneuverability, warload, electronic countermeasures, armor/survivability and operating cost necessary to fight entrenched insurgent terrorists.

The MACHETE is an advanced, high performance COIN platform suitable for COIN, CAS and FAC missions. The MACHETE will provide superior COIN and FAC capability in terms of performance, supportability, maintainability, and affordability than current and previously produced COIN platforms. The MACHETE will allow the US DoD to procure a next generation COIN platform to satisfy future CAS, COIN and FAC needs. Developed specifically to function within the US DoD logistical environment and scheduled for full weapon system qualification under DoD MIL-SPEC, the MACHETE can be integrated into the US DoD logistical support structure without undue modification or difficulty. Featuring common symbology, instrumentation and compatible data links, the MACHETE platform is fully interoperable with existing defense practices and protocol.

Developed specifically as a superior successor to the OV-10 Bronco and A-37B Dragonfly, the MACHETE is capable of exceeding the requirements of all roles and duties previously assigned to those aircraft. Both the OV-10 Bronco and A-37B Dragonfly were developed to satisfy US DoD COIN aircraft requirements. The OV-10 was procured by both the USAF and USMC, while the A-37B was procured by the USAF. Total US DoD procurement of the OV-10 was approximately 270 aircraft. Total US DoD procurement of the A-37 was over 400 aircraft. Both the OV-10 and A-37B were retired from USAF/USMC service during the mid-1990s and neither platform has yet been replaced.

Now that the United States is engaged in the war on terrorism, the MACHETE could serve as an excellent anti-terrorist/anti-insurgent aircraft exceeding the performance of its predecessors which are without equivalent in current US DoD service. STAVATTI anticipates that the MACHETE could serve as a dedicated successor for at least two platforms, resulting in a total of no less than 200 to 400 domestic sales.

Additionally, the A-10A Thunderbolt II was developed by the USAF as a Super-COIN platform. A total of over 700 A-10As were produced for the USAF until 1984. The USAF is gradually retiring the A-10A and is assigning a number of A-10As to the FAC role, redesignating them OA-10A. The MACHETE could replace the OA-10A in the FAC role, as well as any A-10As assigned to the COIN role.

A low-cost, high performance COIN platform, the MACHETE could be procured by the US DoD as a dedicated, Super-COIN platform to replace recently retired OV-10s and A-37Bs. Designed specifically to fight the Mojahedin in the Pacific Rim, both the USAF and USMC could employ the MACHETE in the ongo-

ing war on terrorism. Applying lessons learned from the Soviet Afghanistan Campaign of the 1980's, the MACHETE incorporates design features which ensure the aircraft is capable of dispatching terrorist threats while ensuring aircrew survivability and total mission success. As the threat of terrorism increases in years to come, the MACHETE will serve as a suitable counter insurgent aircraft for the next twenty years. Appropriate for covert procurement by the Intelligence Community (IC) for use in clandestine COIN operations and/or for distribution to IC backed insurgent groups attempting to overthrow totalitarian regimes, the MACHETE is the only all-new, from-the-ground-up integrated COIN system under development today, anywhere worldwide.

XX. MACHETE PROGRAM INDUSTRY TEAM

Success of the SM-27, from prototype to production, results from the combined efforts of MACHETE Industry Team Members (ITMs). Spearheaded by STAVATTI-Tactical Air Warfare Systems Division, STAVATTI will subcontract over 110 primary MACHETE ITMs include over 23 first tier, 9 second tier and 39 third tier partners, including US DoD prime contractors and Small Disadvantaged Businesses alike, in over 20 states nation-wide. Of those states, 8 are home to more than 3 contractors with major participant states being Arizona (3 ITMS), California (31 ITMs), Connecticut (9 ITMs), Minnesota (4 ITMs), New Jersey (3 ITMs), Illinois (3), New York (6 ITMs), Ohio (10 ITMs), Texas (5 ITMs) and Utah (4 ITMs).

An international program, MACHETE ITMs include resident businesses of more than 6 allied nations including Canada (2 ITMs), Belgium (1 ITM), Czech Republic (1 ITM), Israel (3 ITMs), Switzerland (2 ITMs) and the United Kingdom (5 ITMs). All MACHETE industry team members are ISO 9000/9001/9002 certified or equivalent. Qualified SM-27 ITMs include:

TABLE 14.0: SM-27 MACHETE™ 1st TIER INDUSTRY TEAM

TEAM MEMBER	COMPONENT	LOCATION
Pratt & Whitney Canada	PW127G Turboprop	Canada
Hamilton Standard	Propeller	Connecticut
Martin Baker	Escape Systems	UK
CMC (Fmr. Flight Visions)	HUD & Processor	Illinois
Rockwell Colllins	Comm System	Iowa
Ion Corporation	Integrated Electrical System	Minnesota
Raytheon	Transponder, ECM	Maryland
Northrop Grumman	GPS/INS	California
Honeywell	Displays, Instruments	Arizona
Sierra Research	TACAN	New York
Oerlikon-Reinmettal	Internal Cannon	Switzerland
IAI Elta Electronics	Radar	Israel
Elisra	Electronic Warfare	Israel
Goodrich	Wheels and Brakes	California
Hexcel	Graphite Composites	Utah
Alcoa	Aluminum	Pennsylvania
GD/Computing Devices	Stores Management	UK
BAE (Fmr. Tracor)	Countermeasures	Texas
Lockheed Martin	Control Systems	New York
Messier Dowty	Landing Gear	UK
TEXSTARS	Canopy	Texas
Dupont	Kevlar®	Delaware
General Dynamics	Internal Cannon	Vermont

TABLE 16.0: SM-27 MACHETE™ 2nd TIER INDUSTRY TEAM

TEAM MEMBER	COMPONENT	LOCATION
EDO Fiber Science	Pylons	Utah
Litton	OBOGS	Iowa
Sargent Fletcher	External Tanks	California
EG&G Inc.	Airframe Systems	Massachusetts
Goodyear	Tires	Ohio
Remmelle Engineering	Invar Molds	Minnesota
Huck International	Rivets	California
Universal Alloy Corp.	Extrusions	California
DynCorp International	Aviation Services	Texas
CMC Electronics	Displays & Control Units	Canada
L-3 Communications	Collision Warning/TCAS	Michigan
EADS Deutschland GMBH	Electronic Warfare	Germany

TABLE 17.0: SM-27 MACHETE™ 3rd TIER INDUSTRY TEAM

TEAM MEMBER	COMPONENT	LOCATION
Pacific Scientific	Controls, restraints	Arizona
Western Precision	Machined Components	Utah
Ulbrich Stainless Steels	Stainless Steel	Connecticut
Senior Flexonics	Pneumatics	California
United Instruments	Instruments	Kansas
Bandy Machining	Hinges	California
Barry Controls	Flight Controls	California
Bell-Memphis	Control Hardware	Tennessee
Wah Chang	Zirconium	Oregon
Vermont Composites	Composites	Vermont
Standard Wire & Cable	Cable	California
Staco Switch	Switches	California
EATON	Switches	California
Whelen Engineering	Strobes & Lighting	Connecticut
Figgie International	Display Systems	Ohio
Kaman Aerospace	Composite Assemblies	Connecticut
RMI Titanium	Titanium Components	Ohio
3M	Coatings	Minnesota
Kollmorgen Corp.	Motion Controls	Massachusetts
Texas Instruments	Electronics	Texas
Aero Gear Inc.	Hardened Gears	Connecticut
Aero Instrument Co.	Heated Pitot	Ohio
American Fuel Cells	Fuel Cells	Arizona
Smiths Group PLC	Electronics Systems	UK
B-J Enterprises	Exotic Alloys	Oregon
Bristol Babcock	Pressure Switches	Connecticut
Humphrey, Inc.	Instruments	California
Marion Controls	Composites	Virginia
Moog, Inc.	Actuators	New York
Norton	Raydome	Ohio
Mason Electric	Flight & Throttle Grip	California
Rosemont	Air Data Sensors	Minnesota
Mikrotechna Praha	Aircraft Instruments	Czech Republic
Revue Thrommen	Aircraft Instruments	Switzerland
Meggitt Avionics	Aircraft Instruments	UK
Andrea Electronics	Intercom	New Jersey
Rafael	Litening Targeting Pod	Israel
Carlton	OBIGGS	New York
FN Herstal S.A.	Machine Gun	Belgium
Symetrics Industries	Electronic Warfare	Florida
ATK	Machine Gun/Cannon	Minnesota
ATK Composites	Composites	Minnesota

TABLE 18.0: SM-27 MACHETE™ 3rd TIER INDUSTRY TEAM (Continued)

TEAM MEMBER	COMPONENT	LOCATION
Abrams Instrument Corp.	Electromech Counters	Michigan
Science & Technology Corp.	Catalysts/Support	Virginia
Accurate Brushing Co.	Precision Assemblies	New Jersey
Century Flight Systems, Inc.	Flight Control Systems	Texas
Airdrome Precision Products	Machined Components	California
Hybrid Technology	Machined Components	California
Everede Tool Co.	Indexable Tooling	Illinois
AJR Industries	Machining & Castings	Illinois
Allen Aircraft Products, Inc.	Fluid Systems Components	Ohio
Circle Seal Controls, Inc.	Precision Valves & Systems	California
API Delevan Inc.	SMT Electrical Components	New York
Armtech Defense Products	Decoys, Flares & Chaff	California
Auto-Valve Inc.	Fuel & Hydraulic Valves	Ohio
Barnes Aerospace	Airframe Assemblies	Utah
Cartridge Activated Devices	Explosive Bolts	New Jersey
ELDEC/Crane Aerospace	Proximity Sensing Systems	Washington
Nu-Tech Industries	Machined Components	Missouri
Preece Inc.	Hose Assembles	California
Haskel Intl. Inc	Hydraulic & Pneumatic Equip.	California
Kamatics Corp.	Mechanical Drives	Connecticut
Maverick	Polyimide Composites	Ohio
Novatronics	Position Transducers	New York
AC TECH	Specialty Sealants	California
Ontic Engineering	Hydraulic Accessories	California
PerkinElmer	Seals & Joint Assemblies	Maryland
Harco	Thermocouples	Connecticut
Skurka Engineering	Electric Motors	California
Hi-Temp Insulation	Insulation & Metal Fab.	California
Viasat Inc.	Link 16 Elements	California
Wamco, Inc.	Night Vision Lighting	California
ICE Management	Aircraft Deicing	California
DIAB	Composite Sandwich	Texas
California Drop Forge	Titanium Forgings	California
FiberCote Industries	Composite Prepeg	Connecticut
General Veneer Manufacturing	Interior Panels	California
Weber Metals, Inc.	Titanium Forgings	California
Otto Fuchs Metallwerke	Non-Ferrous Forgings	Germany
Hi-Shear Corp.	Fastening Systems	California
Inland Technology Inc.	Eco Solvent Solutions	Washington
Magnolia Plastics, Inc.	Compounds & Resins	Georgia
Precision Cast Parts	Complex Metal Components	Oregon
RTI Int. Metals Inc.	Specialty Extruded Shapes	Ohio
Honeywell	SPECTRA® 2000	International

END NOTES…

1. In 1964 a tri-service requirement for a T-28D NOMAD successor aircraft, known as the Light Armed Reconnaissance Aircraft (LARA), was sponsored by the USMC. The LARA was to be built in significant numbers for the USAF, USMC, USN and US Allies. The need to replace the T-28D became a matter of urgency, however, by February of 1964 when the VNAF A-26 fleet was grounded and subsequently withdrawn due to wing structural failure. By 1968 the USAF, USMC and VNAF began receiving the platform which resulted from the LARA program: the OV-10A Bronco. Built by Rockwell International, the Bronco was designed specifically to fight limited 'brushfire' wars and entered the LARA competition as the North American NA-300. Considered as the world's first dedicated COIN platform, the OV-10 was introduced as a prototype in 1965 and entered production in 1967. A total of 271 OV-10s were subsequently delivered to the USMC and USAF, with several additional aircraft being exported to U.S. allies worldwide.

2. A Letter of Commitment (LOI) was issued on 22 May 2001 and executed for said revolving line of credit from SAHREYA GROUP, PO Box 14833 Fayha, KUWAIT to Allied States Trust/J.F.H., the Strategic and Joint Venture Partner for the STAVATTI MACHETE PROGRAM. Subsequent letters relevant to the status of of loan/line of credit closure were provided on 21 June 2001 and 31 July 2001. Ultimate loan/line of credit closure was to occur in the third [redacted] SAHREYA GROUP at the time, was owned by Sulaiman Al-Wazzan, a member of the Al-Wazzan Group (one of the largest business houses in Kuwait) which was founded in 1950 and is managed/controlled by family members. Total employment in the group is near 35,000. Although a private company with no published financial statements, total annual sales and business turnover was then approximately $3 billion Kuwaiti Dinars.

[redacted]

4. STAVATTI conducted SEC Regulation D Rule 504 and Rule 506 private placements, resulting in the equity sale of STAVATTI common and preferred stock to shareholders.

5. USAF fighter procurement rates from 1992 through 2001 averaged only 16 aircraft per year. In 1995, the USAF procured no new fighter aircraft whatsoever. Comparatively, between 1985 and 1991, the USAF bought an average of 201 fighter aircraft per year. Instead, from 1992 through 2001 non-combat systems (including trainer aircraft) accounted for 49% of all USAF purchases. From 2001 through the present, acquisition of new combat aircraft has increased slightly, resulting in the budgeting for procurement of 42 F/A-18E/Fs, 11 V-22s, 11 C-17s and 22 F-22s, such budgeting still does not compare with that of prior decades, nor address COIN/FAC requirements.

6. The RDT&E development model presented within this White Papers differs from that featured in the MACHETE EXECUTIVE SUMMARY due to a difference in unit flyaway cost ($6 million vs. $8 million) and a distinction made in aircraft RDT&E costs.

7. Candidate selection weighting quoted from an email received by STAVATTI on 22 November 2004 from Col. Walter J. Schell, Chief, USAF Mission in Colombia.

8. As taken from CASE STUDIES IN THE DEVELOPMENT OF CLOSE AIR SUPPORT, edited by Benjamin Franklin Cooling, produced by the USAF, Office of Air Force History for the Special Studies series in 1990, page 1.

9. This is, in essence, identical to CAS.

10. In 1957, the complete VNAF inventory consisted of one squadron of F-8Fs and RF-8Fs, two squadrons of L-19s and two squadrons of C-47s.

11. The Skyraider had been produced between 1947 and 1957 with a total of 3,180 built.

12. Parties interested in obtaining the average unit flyaway cost of used examples of these platforms are encouraged to consult TRADE-A-PLANE

13. The Raytheon Beech T-6 Texan II is a derivative of the highly successful Pilatus PC-9 Turbo Trainer, built under license by the Beechcraft division of Raytheon. Although the T-6 Texan II has yet to be marketed as a COIN platform and is currently entering production solely as a primary trainer for the USAF/USN, the PC-9 from which it was derived has had a long history of being marketed as a COIN platform in addition to being the world's best primary trainer. STAVATTI Anticipates that the T-6 Texan II will be marketed as a COIN platform like the PC-9 from which it came.

14. Prior to 1965, the Government of South Vietnam required that all US fighter aircraft contain a Vietnamese Crew Member or Observer. This resulted in all COIN aircraft (such as the A-26, T-28D, A-1E and later LARA and A-37B) being two place aircraft.

15. As projected by Raytheon as reported by David M. North in the article TEXAN II UPGRADE on page 415 of Aviation Week & Space Technology (AW&ST), 17 JANUARY 2005.

16. TEST PLAN, developed by G&C may likely serve as the Stavatti/AFFTC test correlation software.

[redacted]

18. There are a number of different interpretations with regard to the spelling of the word/name “Mojahedin.” For the purpose of this paper, STAVATTI has elected to employ the spelling used by Jane’s Information Services, in particular, the spelling referenced within the text of the 1996-1997 edition of JANE’S LAND-BASED AIR DEFENSE.

APPENDIX A: ACRONYMS

AAM: Air-to-Air Missile
AGM: Air-to-Ground Missile
AFRES: Air Force Reserve
ANG: Air National Guard
AoA: Angle of Attack
AR: Aspect Ratio
CAP: Combat Air Patrol
CAS: Close Air Support
CBU: Cluster Bomb Unit
CEO: Chief Executive Officer
CFO: Chief Financial Officer
CIA: Central Intelligence Agency
CIO: Chief Information Officer
COIN: Counter Insurgency
CRFP: Carbon Fiber Reinforced Plastic
CRT: Cathode Ray Tube
CTOL: Conventional Takeoff and Landing
DCS: Direct Commercial Sales
DDTC: Directorate of Defense Trade Controls
DEM/VAL: Demonstration/Validation
DoD: Department of Defense
DoS: Department of State
DSCA: Defense Security Cooperation Agency
DT&E: Development Test & Evaluation
DTIC: Defense Technical Information Center
ECCM: Electronic Counter-Counter Measures
ECM: Electronic Counter Measures
EMD: Engineering Manufacturing Development
EW: Electronic Warfare
FAA: Federal Aviation Administration
FAC: Forward Air Control
FAC: Fuerza Aerea Colombiana (Colombian Air Force)
FAR: Federal Aviation Regulations
FAR: Federal Acquisition Regulations
FeRNs: Federal Reserve Notes
FLIR: Forward Looking Infra-Red
FMS: Foreign Military Sales
FRP: Full Rate Production
FSD: Full Scale Development
FSO: Facility Security Officer
Ft: Feet
G: Load Factor (Acceleration Due to Gravity)
HARM: High Speed Anti-Radiation Missile
HDD: Head Down Display
HUD: Head Up Display
HOTAS: Hands On Throttle And Stick
IAF: Israel Air Force
IFF: Identify Friend or Foe
IFR: Instrument Flight Rules
ILS: Instrument Landing System
In: Inches
IPO: Initial Public Offering
ITAR: International Traffic in Arms Regulations
ITM: Industry Team Member
JDAM: Joint Direct Attack Munition
JPATS: Joint Primary Advanced Training System
J-V: Joint Venture
Kts: Knots Per Hour
LANTIRN: Low-Altitude Navigation and Targeting Infra-Red for Night
Lbs: Pound Weight or Pounds Force
LCD: Liquid Crystal Display
LGB: Laser Guided Bomb
LRIP: Low Rate Initial Production
LORAN: Long Range Aid to Navigation
LWS: Laser Warning System
MAC: Mean Aerodynamic Chord
MAWS: Missile Approach Warning Systems
MIL-SPEC: Military Specification
mm: Millimeter
MFD: Multi-Functional Display
MOTS: Military-Off-The-Shelf
MRF: Multi-Role Fighter
MSIP: Multi-Stage Improvement Program
MSOGS: Molecular Sieve Oxygen Generating System
MTOW: Maximum Take Off Weight
NACA: National Advisory Committee on Aeronautics
NASA: National Aeronautics and Space Administration
NATO: North Atlantic Treaty Organization
NRE: Non-Recurring Engineering
Nm: Nautical Mile
ODTC: Office of Defense Trade Controls
OTAN: NATO spelled Backwards (For the French)
PAV: Prototype Air Vehicle
PRTV: Production Representative Test Vehicle
RCS: Radar Cross Section
RDT&E: Research, Development, Testing & Evaluation
R&D: Research & Development
RDS: Rounds Of Ammunition
RFI: Request For Information
RFP: Request for Proposal
ROC: Rate-of-Climb
ROI: Return On Investment
RWR: Radar Warning Receiver
SAM: Surface-to-Air Missile
SEAD: Suppression of Enemy Air Defenses
SFC: Specific Fuel Consumption
SHI: Stavatti Heavy Industries
SHP: Shaft Horsepower
SL: Sea Level
SP: Strategic Partner
SPJ: Self Protection Jammer
SPS: Self Protection System
St: Static Thrust
STOL: Short Takeoff and Landing
TACAN: Tactical Air Navigation
TAI: Total Active Inventory
UCA: Unmanned Combat Aircraft
US: United States
USAF: United States Air Force
USANG: United States Air National Guard
USD: United States Dollars
USMC: United States Marine Corps
USN: United States Navy
USTOL: Ultra Short Takeoff and Landing
VDC: Volts Direct Current
VFR: Visual Flight Rules
VHSIC: Very High Speed Integrated Circuit
VOR: VHF Omi-directional Range